

# ABOUT HINDU DHARMA

351 Indian Messages on Hindu way of management  
+ What is Hindu Dharma and what is Hindu Dharma  
and What is not Hindu Dharma



**DR. N. GOPALAKRISHNAN**

M.Sc (Pharm), M.Sc (Chem), M.A. (Soc), MBA Ph.D., D.Litt.  
(Scientist & Director IISH)

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**For knowing Hinduism**

**You should know the scientific meaning of**

**The Customs and Rituals of Hinduism.**

**The spirituality and symbolism of Hinduism.**

**The Literature and Message of Hinduism.**

**The Scientific and Technological Heritage of Hinduism.**

**For knowing all these, it will take more than a hundred janma/birth for you!**

**All the knowledge present in Christianity put together could be printed in one book.** - The Bible

**All the knowledge present in Islam put together could be printed in one book.** - The Koran

**But all the knowledge of Hindus could not be printed in one book. So the Hindus have 4 vedas, 19 Brahmanical books, 11 Aranyakas, 108 Upanishads, 18 books, each under Siksha - Norukta - Vyakarana - Chandra sastra - Kalpa sastra Vedangas, 18 Mahapuranas, 18 uppuranas, 2 itihasas, 6 Darsanas and 5 Upavedas..... an unending list of Hindu/Indian heritage.**

**If one copy each of the above books is placed one above the other, it is said that the pile will have the total height of 4 telephone poles. Hindus knew that the ocean of human knowledge is so vast that it cannot be printed in one book by one man or by one saint. Here presented is an outline of Hindu knowledge.**



## INTRODUCTION

The Sanskrit word “Subhashita” literally means (su = good bhashita = messages) “good messages”. Hence subhashitas are the capsulated forms of the messages for a better life. In-fact they are the messages for an integrated management. These messages of classical wisdom are powerful and poetic idioms, unique to every branch of Sanskrit literature. They are the most valuable life-enriching messages given in very attractive way with minute examples seen generally in one’s day today life. Generally the examples are from various Indian spiritual literature or from what is seen around us.

Merely giving valuable moral advice is dull and didactic. Hence that is generally avoided in Indian books on management. While isolated and beautiful quotations which becomes by-heart for the student of management are presented here. in imagery is only sensuality. In the Subhashitas, collections of the management principles, we can see a blending of the top quality messages and practical examples.

Sanskrit has a perennial source of Subhashitas. The Vedas, Upanisats, Smritis, The Ramayana, The Mahabharata, Puranas, Agamas, Darsanas, Epics, Lyrics, Dramas, Sastric, neetisaras, panchatantra, darsanas, Vedas, smruties, texts and many more are primary sources of unforgettable words of wisdom. Added to these, there are numerous independent compendiums, written by visionary poets like Bhartrhari, Bhallata, Visnu Sarma, Sundarapandya, Narayana, Ksemendra and Nilakantha Dixita. Added to this are the contritbutions of philosophers, dharmacharyas, scholars like



Chanakya, Vidura, Sukracharya, Patanjali, and so on. These apart, many anthologies are available, which contain many a charming Subhasita, culled out from the vast and varied literatures in Sanskrit. *Subhasita Ratnakosa*, *Subhasitavali*, *Suktimuktavali*, *Subhasita*, *Sudhanidhi*, *Sarngadharapaddhati*, *Saduktikarnamrta*, *narabharana*, *Kavitamrtakupa*, *Samayochita Padyamalika*, *Subhasita Ratnabhandagara* are but a few significant collections among them. This process of preparing the anthologies of choice Subhasita is still relevant and a few good collections like *Subhasita Manjari*, *Suktimala*, *Nityaniti*, *Subhasita Sangraha*, *Nitisara* etc., are available in Kannada translations.

Subhsitas are shrowded in ancient Vedic literature, but compilations of Subhasita as such can be traced from the 10<sup>th</sup> century A.D. Vidyakara of 10<sup>th</sup> Century A.D., Sridharadasa of 1205 A.D., Jalhana of 1257 A.D., Sarngadhara of 1363 A.D., Sayana of 1323 A.D., Vallabhadeva of 1417 A.D., Sundaradeva of 17<sup>th</sup> century A.D., Narayana Ramacharya of 1900 A.D etc., are few remarkable milestones in the preparation of lasting treasures of Subhasitas.

The contents of Subhasitas are rich and varied, dealing with righteous conduct through dharmic values, Judicious and sustainable pleasure, wise and shrewd economical concepts, love towards all aspects of nature and natural forces, virtue of the good in what is happening around us / in nature, cautions against all aspects of the words and deeds of the wicked, lasting friendship with the good, significance of learning different type of knowledge from the experienced gurus/teachers, modesty in behavior, charity in life, patience as a great pathway for success in life, compassion to those



who deserve, morality, pride and self respect and prejudice, all sorts of sustainable wealth, psychological and physiological health, universal love and brotherhood which binds the society and nation, human relations and self realization for an integrated growth and existence.

Through subhashitas high quality management principles are given in such a way that the quotations are remembered for ever. The student is expected to remember the sloka/ stanza and quote whenever it is required. So that it gives a correct direction for the person and also a psychological relief on selecting the correct pathway. Dry preaching is boring. If instruction is wedded to striking analogy and charming illustrations, it will be joyfully received. Hence Subhasitas are always associated with poetic fragrance and verbal melody. This is the traditional tact of prescribing bitter medicine with honey. While doing so, many techniques are employed. Satire, hyperbole, simile, metaphor, wit, fun, image and many more are the modes effective communication and interaction. Listening to Subhasitas, therefore, is always a refreshing experience and it is sure to bring light and delight to the listeners.

Here is a compilation of Subhasitas culled out from the rich mines of Sanskrit lore. Majority of the collections are presented here from Dr. S. Ramaswamy's work.

Bhagavth geetha, yogavasishta, Bharthruhari's upadesa sataka and neetisataka Chanakya neetisara, Sukra neetisara, Bhishma upadsa, Vudura upadesa are also excellent books gives messages on the Indian approach to management.



1. Given over egotism, brute force, arrogance, lust and anger, some people always behave in their life leading to terrible negatives for themselves and for others.

Bhagavath geetha-16/18

2. Over ambition anger and greed are the triples gates for the hell and they will ruin everything in one's life if not properly controlled.

Bhagavath geetha 16/21

3. There are three type of qualities for everything and every type of approach. They are *saatwika*, *rajaseeka* and *thaamasika*. This can also be called as three level of the human beings. At the lowest and most negative level is *thaamasika*, at a higher level it is *rajaseeka* and the best and top quality level it is *saatwika*.

Bhagavath geetha chapters 17 & 18

4. There are *satwika*, *rajaseeka* and *thaamasika* types of temperaments, personalities, focus, aims, pathways, results, processes, methods, foods, nature, etc. hence if you are in the *thamasika* level, try to grow higher to *rajaseeka* first and then to *satwika*. Bhagavat geetha Chapters 17 & 18

5. Treating alike the victory and defeat, gain and loss, pleasure and pain, get rady for facing the life. You will attain happiness

Bhagavath geetha 2/38

6. Whose mind remains unpurturbed amid sorrows, whose thirst for pleasures ahas altogether disappeared and who is free from over passion, fear and anger heattains the goal faster.

Bhagavath geetha 2/56

7. There is not a single merit of the virtuous which is not branded as a defect by wikced men, modesty is counted as dullness. Religious practice s ostentation, honesty as dissimulation, valour as mercilessness, meditation as lack of intelligence, gentleness of speech as feebleness, prowess as arrogance and strong power of expression as garrulousness.

Bhartruhari neetisataka



8. Obeisance to that effulgent spirit who transcends space and time, who is infinite, who is the very personification of consciousness, who is tranquil and who can be known only through inner experience.  
Neetisatakam-1
9. Obeisance to Sarada Devi the Chandrakaladhara who has transformed the bliss of knowledge into beauty in herself. She is reflected in the mirror of our mind according to the quality of its cleanliness.  
Nityaneeti-2
10. He who is taught by the Sages, he who has inherited the Vedas and the Sastras and does not contradict them and he who has been initiated to discriminatory logic; he only is to be recognized as a Dharmajna. Not anybody else.  
Manusmruti -12-106
11. Mind is the master of the entire army of senses. Hence winning over the mind is the real victory. A person with leather footwear feels as though the whole earth is covered by hide.  
Subhashitavali 3-347.
12. Just as a ball thrown at the wall rebounds back, the evil that is done to another boomerangs to the perpetrator.  
Kathaasartsagara 3-6-213
13. Money can be spent in three ways-by giving in charity, by enjoying it, or destroying it. He who neither gives it to another nor enjoys it himself-the third alternative is inevitable.  
Neetisatakam-34
14. What are the defects of philanthropist? What are the merits of a miser? There is no defect greater than stinginess. There is no merit greater than charity.  
Sabharanjanasatakam 36
15. He who maligns the good maligns himself. The ashes that are thrown at the sky falls on one's own head.  
Dushtantakalikasatakam- 27



16. One should visit royalty and meet its close associates. Even if there is no benefit from it, one can at least avoid their hindrances.  
Neetidwisheshtika - parisishtam-19
17. Some were ruined by ignorance. Some were destroyed by carelessness. Some were ruined by the pride of their supposed knowledge and scholarship; yet others were ruined by these ruined peoples. Subhashitam-153/14
18. The wise should learn to accept wisdom from anybody, even from a child. Doesn't the small nightlamp shine things which the sun can not? Subhashitam -153/25  
Charitable nature, the art of pleasant speech, courage of conviction, right conduct – these are not the results of cultivation; they are inborn. Subhashitam 158/213
19. For the poor man sensual enjoyment is like poison. For the coward, battle is like poison. For the uninitiated, knowledge is like poison. For one who has indigestion, food itself is poison.  
Hitopadesa-10
20. The frog proudly keeps croaking though it drinks filthy water. The cuckoo doesn't feel proud though it feeds on delicious mango juice. Nityaneeti -28
21. The doer, the promoter, the instigator and the approver, all the four share the responsibility equally in good or bad deeds. Nityaneeti-30
22. Dharma destroys him who destroys Dharma. Dharma does protect him who protects it. Dharma therefore should not be abandoned. That Dharma, which is going to perish shall not destroy us. Nityaneeti - 14
23. The wise could never launch anything which bears no fruit, which ends tragically, which has no gain over the expenditure and which is impossible. Subhashitavali-2720

24. Earning money is tribulation; protecting it is problem. If money is lost it causes sorrow. Even to spend it is painful. Down with money, the cause of all! Nityaneeti-37.
25. One who has no merit cannot appreciate merit. However, a merited person is jealous of another meritorious person. Thus a simple man of merit who appreciates the meritorious is very rare. Subhashitam - 45/13
26. Nobody trims the hair on the eyelids, but the hair on the head is regularly cut. In the world, only those who are growing and productive, face impediments. Nityaneeti-40
27. In order to understand the golden streaks-the ups and downs of friendship, a knowledge of what the friends say behind one's back is the measuring instrument. Nityaneeti-42
28. The capricious tongue slips easily because it is in the wet region. It needs to be bound firmly by the rope of discrimination. Nityaneeti- 44
29. The virtuous perceive their virtues through the others. The shall perceiving eye perceives itself only through the mirror. Nityaneeti -46
30. Even the weak, when they are in good number, gain strength. A rope that is made a strands of grass can bind even an elephant. Nityaneeti- 47
31. Merely because a bamboo grows in the Malaya mountain, it does not becomes sandalwood. Who can install quality in one who is hollow? Nityaneeti-48
32. An evil person, though learned should be avoided. Though a serpent is adorned by a jewel does it not strike terror? Hitopadesa- 1/82
33. What is the purpose of parrot-like learning devoid of practice? It may, as best, entertain people. Darpadalanam- 3/31



34. When a mean person maligns a noble person, the noble one does not retaliate. When a dog bites a man, the man does not bite the dog in return. Neetidwisheshtika -63.
35. The anger of the noble, like the friendship of the low, does not easily occur; if it occurs it is only momentary and the result is different. Bhojacharitam-285
36. The faulty who tries to find fault with the faultless cannot sleep in comfort as if in a snake-haunted house. Nityaneeti- 76
37. Good people, even when they are angry, melt if occasion arises- not the mean ones. Solid gold can melt but not a blade of grass. Neetiswishtika -101
38. A mild person can derive benefit in the association of the strong, just as the soft tongue enjoys different tastes because of strong teeth around. Kavitamrutakoopam-33
39. Just as mere ploughing of the fields without sowing does not bear fruit, mere faith will not yield anything. Nityaneeti- 86
40. Familiarity, breeds contempt! Though dwelling in the holy sangam of Prayag, don't people bathe in well-water? Neetidwisheshtika parisishtam -16
41. By kinetic movement, even an ant covers hundred of miles; but a static kite doesn't move a step forward. Nityaneeti- 98
42. A wise person must give happiness in whatever manner to whatever living being; that itself is the worship of God. Nityaneeti- 100
43. When the sorrow is confided to a friend, it lightens the mind. Those who are carrying weight do transfer it from one to another shoulder, don't they? Subhashitasudhanidhi- 131
44. Mental repetition is definitely better than mere hearing of the sastras. However, practicing it is even better than mere repetition of the same. Nityaneeti 108

45. Truth is my mother, Knowledge is my father. Dharma, righteousness is my brother. Compassion is my preceptor. Peace is my friend. Forgiveness is my sister. These six are my true relatives.  
Nityaneeti- 110
46. It is only hard work and effort that result in fruitful achievement – not mere idle speculation. Animals do not fall into the open mouth of a sleeping lion of their own accord.  
Panchatatram- 2/138
47. There is always a difference between the good and the evil. The cow eats grass and gives milk. The serpent drinks milk and generates poison.  
Prasankabharanam -5
48. He who speaks gently, thoughtfully, sparingly, truthfully, discerningly, beneficially and pleasantly is rare indeed.  
Neetidwisheshtika -36
49. One achieves greatness only by good qualities and not because he is seated in a position of power. Just because a crow sits on the top of a palace, it does not become a garuda, the holy kite.  
Chanakyaaneetisatakam –16/6
50. How can sastras help one who doesn't have innate discrimination of intellect? How can spectacle help a blind person?  
Nityaneeti -117
51. One cannot avoid one's fate by running away; fire that has caught the tail feather of a bird follows it wherever it fled.  
Rajatarangini –7/222
52. Only truth must be spoken, and in a manner relished. Unrelished truth should not be spoken, nor relished untruth. This is wisdom eternal.  
Manusmruti –4/138
53. A fundamental quality cannot be changed by advice. Water however hot does become cold once again.  
Panchatatram –1/201



54. One would find those who know ethics, those who know the rule of Fate, those who know the Vedas, those who know the Sastras and even those who have knowledge of the Brahman. But very rarely one finds people who are aware of their own ignorance.  
Variagyasatakam - 26
55. One should be prepared to meet difficulties even before they arise. Staring to dig a well when the house is on fire is not wise.  
Sarngadharapaddhati -1440
56. Poverty is better than ill-gotten wealth. It is better to be lean and healthy than obese and unhealthy. Saarnagadharapaddhati -1441
57. Good looks is the adornment for man. Character is the adornment for good looks. Wisdom is the adornment for character. Forgiveness is the adornment for wisdom.  
Naraabharanam -2
58. When our mind is at peace, everything becomes pleasant. For the contented, even the disagreeable becomes agreeable. For the unhappy even pleasant things become unpleasant.  
Ramayanamanjari -3/1136
59. For the self-respected ones, there are only two ways, as for a bunch of flowers-adorning the heads of others or withering away in a forest.  
Neetisatakam -25
60. By heating it up and melting in fire, by cutting it rubbing it etc., gold is not unhappy; but it becomes sorrowful, when it to be weighed against "gunja" (A precatorious-small seed used to weigh gold against). Subhashitasudhanandalahari 10
61. Of what use is learning scriptures for a person who doesn't have the talent to adjust according to the situation? Of what use are lovely flowers for a bald person?  
Sabharanjanasatakam 13
62. Dependence is sorrow. Self dependence is happiness. This discrimination shows the difference between happiness and sorrow.  
Manusmruti - 4/159

63. A bad man who is stupid, like a fangless snake is better than an evil genius who is tarrying like a black cobra with wings.

Desopadesa -1/18

64. Good health, sound body, freedom from debts, sinlessness, independence, lack of worry and unassailable belief in God – if these are present, it is heaven itself. Nityaneeti -157

65. Love and friendship with the wicked should not be cultivated. Charcoal burns when alive and dirties the hand when cold.

Kavitamrutakopak - 84

66. It is easy to find flattering people. But rare are those who speak unpalatable truths and rarer, a listener.

Ramayanam- 3/37

67. Over-eloquence generates contempt. Silence generates esteem. The noisy anklet is fixed at the feet while the silent jewel adorns the neck.

Nityaneeti -165

68. 'Tapas' is according to the wise; non-violence, truthfulness, generosity, control of the senses and compassion-not mere punishment of the body.

Nityaneeti -166

69. Knowledge brings modesty; from modesty comes worthiness; worthiness would bring wealth; from wealth flows charity. This is the path to happiness.

Nityaneeti -167

70. There is no letter which has no potential of mantra. There is no herb which has no potential of medicine. There is no man who is worthless. But one who can identify these is rare.

Nityaneeti-175

71. Alteration, monetary transaction, begging, excessive talk, borrowing, hankering after position, these break friendship.

Nityaneeti- 182

72. Nobody knows that happens tomorrow. The wise, therefore would not postpone anything indefinitely. Nityaneeti- 191



73. The test of friendship is during one's misfortune. The test of valour is in the battlefield. The test of a servant is by his loyalty. The test of charity is in indigence. Nityaneeti- 197
74. The word that is uttered by the good even casually is like an inscription etched in stone. Even the sworn words of the evil are like what is written on water. Nityaneeti- 206
75. The good qualities of even an enemy have to be mentioned. The shortcomings of even a preceptor have to be mentioned. However, good taste and propriety should not be abandoned while doing so. Nityaneeti- 213
76. Is it enough to declare that one is born in a noble family? Don't briars and thorns grow and flourish in the fertile ground? Mruchaktikam – 8/29
77. Sterile enmity is not to be indulged in. It is like chewing the horn of a cow. It pains the teeth and gums but produces no juice. Nityaneeti- 220
78. The jewel for the hand is charity. The jewel for the neck is Truth. The jewel for the ear is listening to Sastra. Such being the case, when is the need for other jewels? Nityaneeti- 204
79. He who gives away whatever is requested, and he who doesn't ask anything of anybody, has not been in the past, nor will be in the future. Subhashitavali –2973
80. The wind becomes a friend of the burning fire that destroys a whole forest. The same wind mercilessly extinguishes a small flame. Where are friends for the humble? Saarn gadharapaddhati –488
81. One should not lament over the past. There is no use in dreaming of the future. The wise live for the present. Chanakya neeti satakam-13/2

82. Those who are slaves of desire remain slaves of the entire world. But those who have enslaved desire, the whole world is at their feet.  
kavitamrutakoopakam -27
83. No harm will come to him who speaks in accordance with the situation, who acts in accordance with his mental equipment and who gets just as angry as he can afford to.  
Nityaneeti- 234
84. Though the pain of getting the ears pierced in order to wear ornaments and bearing their weight bothers the ears, the cheeks enjoy the beauty. This is the way one is happy in another's unhappiness.  
Nityaneeti- 235
85. What is sorrow? Discontentment. What is lethargy? That which has been learnt but not kept in touch. What is the basis for respect? Not asking for any favours.  
Prasnotararatnamaalika -14
86. An evil not done is good, for, sorrow inevitably follows an evil deed. It is good if only the good is done. That alone is good which does not bring any regret.  
Dharmapadam-2/9
87. Desire is a strange bondage. Those who are bound by it keep continuously running after it. Those who are not bound will stay, but like the lame.  
Subhashitam-76/10
88. That which is considered abusive from an unfriendly source, become good natured raillery if it comes from a well wisher. What is thick smoke from firewood becomes fragrant 'dhupa' from the aguru wood.  
Aryasaptasati -13
89. Never should one cultivate intimacy with wealth. If it is lost all status is lost. If it is gained, it is spent away.  
Nityaneeti- 254
90. However high the buzzard flies, its sight is focused on the rotting flesh. No matter how high a position is occupied by a wicked man, he indulges in despicable acts.  
Nityaneeti- 260



110. Good people don't give up their goodness even if they are occasionally angry just as curds yield only butter when churned.  
Narabharanam -30
111. A wise man should not antagonize people thinking that they are weak and helpless, for, a multitude of ants can eat up even an angry serpent.  
Panchatantram -3/119
112. It takes a great deal of effort to get a rock up the hill. But it can be dropped down in no time. Similarly it takes a lot to build up good reputation but one wrong step is enough to bring infamy.  
Hitopadesa -2/16
113. Cheap and hollow things make more noise than the worthy. Brass makes more noise than gold.  
Yasastilakachampoo-1/35
114. Just as water flows faster in a canal, good natured people tread only the good path; treading the path of the good becomes even better.  
Abharanasatakam - 22
115. Conduct reveals origins. Speech reveals birth and belonging. Involvement and enthusiasm reveal friendship. The body reveals food habits.  
Garudapuram -1/115/74
116. He who travels extensively and he who confers with the learned, will see his mind expanding like a drop of oil in water.
117. Strong-willed, self-respecting individuals would accept death rather than humiliating existence. Fire dies away but never gets cold.  
Hitopadesa -1/45
118. Pray for good conduct, not good looks. Pray for cultured behaviour, not high birth. Pray for achievement, not mere education. Pray for contentment and happiness, not mere wealth.  
Subhashitam-167/645

119. What is Dharma? Compassion towards all beings. What is happiness? Health. What is friendship? Fellow-feeling. What is learning? That which brings liberation.

Subhashitam-17-/769

120. The wise learn and earn leisurely as if they are immoral, but do the righteous act forthwith as if seized by death.

Sarangadharapaddhti -669

121. While consuming darkness, the lamp emits stain. Likewise, activity reflects the quality of the food consumed.

Vruddhachanakya 8/3

122. I would tell you in a sentence what is contained in a million volumes. To help is Punya, to hurt is Papa.

Samayochitapadyamaalika -95

123. Where there are no seekers what can a scholar do? In a land of naked Sanyasins, what can a washerman do?

Subhashitavali -2790

124. An artisan can carve out a golden lotus but can he fill it with fragrance? It is only Mother Nature that can create a beautiful and fragrant flower.

Subhashtam-156

125. One should place the foot forward after scanning the place; one should drink water after filtering it; one should speak according to the dictates of shastras; and one should act after consulting the conscience. Sarngadharapaddhati - 4551

126. All effort must be put in to acquire good qualities. There is no use in indulging in noisy demonstrations. It is not possible to sell a barren cow by tying a nice big bell around its neck.

Subhashitam- 8/12

127. Knowledge of one's own limitations, ability to grasp another's intentions, control over selfishness, pleasant disposition and harmonious attitude, these together is culture.

Nityaneeti- 277



128. Just as the water filled into the human skull, and fire in a funeral pyre lose their sanctity, the abundant knowledge of a characterless man is unworthy. Subhashitasudhanidhi -26

129. The mud that is thrown at the sun falls into one's own eyes. If noble people are insulted boomerangs on oneself.

Abharanasatakam - 42

130. He who consumes the ripe fruit plucked at the right time, not only enjoys the fruit-juice, but also gets the mature seeds for further planting.

Neetikalpataru -9/28;l

131. Even if a wicked person is an expert in learning , he will not attain nobility .though a stone is immersed in water for centuries together it will not become soft.

Bhamineevilasa -85

132. What is the use if a person who gets into a position of power for a short time does not help his friends, the near and dear, and does not punish the enemies ? Neetidwisheshtika -21

133. Those who live day after day without dharma , like the bellows of a blacksmith, though breathing, still are not alive.

Panchatantram -6/3/93

134. It is not always true that a good man begets good progeny. After the fragrant sandalwood is burnt, its ashes do not bear the same fragrance.

Drushtantakalikaasatakam-41

135. Just as the holy dharbha grass cuts the fingers if not held properly, sanyasa, the renunciation if not practiced intently, would lead one to the veritable hell.

Dharmapadam -22/3

136. The wise and outstanding will shine like the sacred Himalaya though at a distance. The wicked who are by the side, deeply hurt like the arrow charged in darkness.

Dharmapadam - 21/15

137. Growing and serving food grains is vital, for it can quench hunger; not a precious diamond in the mouth. Hitopadesa 3/55
138. One who has a disorganized mind, one who has no comprehension of true. Dharma and who has a butterfly-mind will not achieve wisdom. Dharmapadam 3/6
139. A nonfragrant but elegantly colourful flower is not satisfying like unpracticed preaching which carries home nothing.  
Dharmapadam –4/8
140. Hatred begets only hatred; it is love, only love that can cure hatred, according to the eternal Dharma. Dharmapadam 1/5
141. When beset by troubles, even the good tends to bring pain; like the legs of the mother cow becoming the poles to tie up the calf.  
Hitopadesa 1/13
142. The evil once done, cannot be digested like milk. It is like live coal under the ashes burning the vitals.  
Dharmapadam 4/12
143. An earnest seeker, serving the wise even for a short time understands the secrets of Dharma, like the tongue which perceives taste instantaneously. Dharmapadam 5/6
144. One who collects information without proper understanding will not comprehend the true spirit of the Shastras like the ladle which cannot enjoy the taste of the soup though always immersed in it.  
Mahabharatam –2/55/4
145. A good turn done will bear fruit here and hereafter like the water poured to the roots of a plant will bear fruit in the branches.  
Subhashitasudhanidhi –39/1
146. Righteous conduct is the supreme Dharma: is the ultimate penance; it is the absolute knowledge. What is it that cannot be achieved by righteous conduct? Manusmruti –1/108



147. Spending less than earning is practice knowledge; it is tactful skill and is the ultimate wisdom.  
Samayochitapdyamalika -14/1
148. Just as a little oil lubricates the wheel for smooth movement, only a little food is desired by the wise to smoothen the pilgrimage of life.  
Soundaranandam-14/12
149. The little learned is overloud like a ham actor who overacts.  
Neetidwishashtika -30
150. The ocean does not cry for water but it is always filled. A person of inner elevation does not cry for wealth but it comes to him on its own.  
Sooktimuktavali -2665
151. How can ever the wicked hurt one who is full of compassion?  
How can the fire hurt a grassless land?  
Samayochitapadyamaalika -1/8
152. Without the necessary assistance one may not complete the required task; without the husk, grain cannot sprout.  
Panchatantram - 2/51
153. Even gods do not tolerate a good man to be in a high position for long. The full moon shines only for a night.  
Sooktimuktavali - 301
154. Manu the preceptor of Dharma declares that non violence, truth, non-avarice, purity and self-control together is the Dharma to be followed by all without any discrimination.  
Manusmruti-10/63
155. Just as a little one hurt by in the mouth by hot pudding, tries to cool even the curds, one who is hurt by the wicked tends to suspect even the good and noble. Neetiswishashtika - 41
156. May I be blessed with no regrets on the unaccomplished, no egotism over the accomplished, and expeditiousness in what could be accomplished!  
Ananthabharati -46

157. The virtuous consciously earns for righteous spending. The earning of the other without righteous disposition is but filth.  
Dharmapadam- 14/4
158. Nobody coronates the lion; he becomes the lord of the forest by his own might. Garudapuram -1/115/15
159. The wise should scorn both the favour of frown of the wicked; the dog's lick or bite, either is disgusting.  
Sarngadharapaddhati -367.
160. Both the crow and the cuckoo are black and look identical; but the spring reveals the truth. Kuvalayananda -164
161. When one is possessed by insolence, his friendship becomes enmity, his offerings become burglary and his knowledge becomes unadulterated stupidity in hundred folds.  
Darpadalanam-1/34
162. What use is it staying in the forest when one has not conquered the passions? And what use is it staying in the forest who when one has conquered the passions?  
Subhashitasudhanidhi- 65/24
163. The wise are like a balance: heavy with the light, light with the heavy, and equal among equals. Nityaneeti -146
164. The virtuous come to know of their great qualities only through others like the all pervading eye can see itself only through the mirror. Vasavadatta - 12
165. Simply because a wicked person is from a good family he should not be trusted. Even the cool Chandana tree when caught by fire is bound to hurt. Neetidwisheshtika -17
166. Virtuous qualities cannot be suppressed; the fragrance of 'Kastoori' incense cannot be cancelled even by an oath.  
Kuvalayananda -51



167. The true spirit of Dharma expresses itself in ten folds: steadfastness, compassion, sense control, nonviolence, purity, mind control, wisdom, knowledge, truth and non-temper.  
Manusmruti -7/92
168. Gods, the elders and the good are appeased by righteous conduct; relatives are appeased by hospitality; and the scholars are appeased by learned talk.  
Sooktimalika -724
169. The word of the wise is like the ivory of an elephant: it cannot be withdrawn. The word of the wicked is like the tongue of the snake; shows up and recedes always.  
Kavaitamrutakoopam -22
170. For a person who is removed from his position of power, even his friend becomes enemy. The sun scorches the lotus when removed from water; he does not make it bloom.  
Neetidwisheshtika -48
171. The world can easily be won by forgiveness, compassion, love, good words, honesty, politeness, and service.  
Sooktimala -82
172. He who speaks to suit a situation, acts according to one's intention, according to ability and equipment – does not come to any harm.  
Kavitamrutakoopam -97
173. He who studies, scripts, perceives and interrogates the wise will have a mind that blossoms like the lotus exposed to the rays of the sun.  
Sooktimala -186
174. Drop after drop of water fills the pot. Likewise the knowledge, wealth and righteousness. Hitopadesa-2/4
175. Dharma, the way of life should not hurt the way of another's life. Dharma is non-hurting.  
Sooktimaala -233

176. It is only the good character that declares one a Brahmin; not his birth, nor his family, not even his learning and erudition.  
Mahabharatam –3/178/16
178. Modesty is the basis of morality. The end achievement of all Sastras is the attainment of modesty. Modesty is the triumph over the senses. One who is modest will achieve the quintessence of all the Sastras. Subhashitasudhanidhi -60/1
179. One can win a miser with bounty, the angry with submission, the idiot with like behaviour and the learned with scholarly disposition.  
Subhashitasudhanidhi –82/85
180. Only the eminent have rise and fall, not the mediocre. It is the moon who waxes and wanes, not the stars. Sooktimala 129
181. Conquest of ego is wealth; suppression of desire is happiness; confidence is friendship self control is manhood.  
Subhashitamanjari –511/594
182. The ultimate cleanliness is the cleanliness in matters of money. Other forms of physical cleanliness would not matter.  
Manusmruti –5/106
183. One's own darkness of ignorance cannot be dispelled by heavy words; darkness cannot be dispelled by shouting "light! Light!".  
Sooktimala - 251
184. All attributes are but artificial; it is only the purity of character which is the primeval charm. Subhashitasudhanidhi -511
185. One may own a hundred cows but his need is only one cup of milk; one may own a hundred villages but his need is only one morsel of food. One may own a hundred roomed palace but his need is but one cot. All the rest belongs to others.  
Subhashitamanjari – 491/504



186. One has to be nervous of an impending and fearful occurrence; but once it occurs he should cease to be nervous and face it squarely. Subhashitamanjari – 415/185
187. Curses, black magic, fire, poison, weapon none of these are as sharp and as powerful as forgiveness. Samkalpasooriyodayam –8/79
188. Even an insignificant person attains prominence in the company of the great, like the thread in flower garland which ascends the head. Subhashitamanjari –61/47
189. Just as honey is collected by the bee without hurting the flowers, the tax money must be collected from people without hurting them. Subhashitasudhanidhi –85/3
190. A human has lessons to learn even from a cock: fierce fighting with the adversary; wakefulness early in the morning; eating in company; and unhesitant protection to the female in adversity. Chanakyaneetisatakam- 72
191. Adversity is the only touchstone by which one could estimate true friendship, true relation and one's own courage and intelligence. Subhashitasudhanidhi –131/7
192. A dear friend, though with shortcomings, should not be discarded, but treated like one's own physical body. Hitopadesa –2/132
193. The study of all the Vedas, bathing in all the sacred rivers, achieving the fruit of all sacrifices none of these is as potent as non-violence. Sooktimala - 413
194. Always help the needy, not the well-to-do; it is the indisposed who requires treatment, not the healthy. Sooktimala - 108
195. Even a dog has six lessons for the human being: eating only when food is available, contentment with little, sound sleep, instant wakefulness, total devotion to the master and fearless bravery. Chanakyaneetisatakam -69

196. It is the humble, not the mighty that can offer help; it is the humble well, not the mighty ocean that can quench thirst.  
Subhashitamanjari -389/85
197. Sudden in-pour of wealth may destroy one's peace, like the sudden torrential rain which would break the dam and overflow the canals and fields.  
Subhashitamanjari -509/586
198. One who has not experienced the supreme bliss is prone to think that sensual pleasures are the highest enjoyment; one who has not tasted ghee (boiled butter) may think that the gingelly oil is most tasty.  
Subhashitam - 170/767
199. A word of want will never come out of the self respecting; if it did, it would be with his own final breath. Sooktimala - 612
200. The mind of one who travels extensively and serves the wise, expands just as a drop of oil in water. Subhashitam- 98/2
201. Avarice is the origin of all sins. Gluttony is the origin of all diseases. Desire is the origin of all sorrows. Give up these three and be happy.  
Sooktimala-684
202. If you want to make the world your own and keep it under control by a single act, then avoid sending your cow (lending you support) to graze in others' fields (who are indulging in scandals and character assassination). Kavitaamrutakoopam -69
203. People will be vociferous as long as the philanthropist doles out, but sink into silence the moment the benevolence stops, like the peacock which stops the howling when the water-bearing clouds disappear.  
Subhashitam-171/792
204. Three categories of people can make gold out of this wealthy earth: the valorous, the learned and the one who has mastered the art of service.  
Mahabharatam-5/35/74
205. He whose anger is not feared by anyone, he whose contentment does not fetch any money, he who is incapable of maledicting or



benediction, what can such a man do with his anger?

Subhashitam -157/176

206. Elders are looked after with the expectation of some benefits; a cow is looked after only because it yields milk. There is neither devotion nor charity in these acts.

Drishtantakalikasatakam- 93

207. Even when a man leaves his body and burns away leaving only his ashes behind (like camphor burning, leaving behind a pleasant smell), he is known by his good deeds. His greatness is measured by his fame.

Rajatarangini -7/14/35

208. The charm of friendship with the noble, like the juice of sugarcane, becomes intense as you descend along the stem; reverse is the case with the ignoble.

Neetidwisheshtika-16

209. Only the people with discrimination can identify the difference between bad and good qualities. The fragrance of flowers can be perceived by the nose, not by the eye.

Drishtantakalikasatakam - 22

210. One who is determined to hurt others does not mind his own pains in the process. The clip which gripping an object does not realize that it is pressed hard itself.

Hariharasubhashitam-3/18

211. The mind of the evil hardens in prosperity and softens in adversity like the iron, hard in cold and soft in heat.

Drushtantakalikasatakam - 79

212. If love is ignored it is difficult to restore it, just as a pearl broken cannot be repaired.

Ramayanamanjari - 4/107

213. Nicety may be necessary till friendship is forged; after that, nicety is but artificiality.

Bhojaprabhanta - 108

214. It is cowardly not to start, fearing failure. Who has given up eating for the fear of indigestion?

Hitopadesa-2/50

215. One should earn with righteous effort; what is so earned should be guarded consciously; what is so protected should always be multiplied; what is so multiplied should be distributed to the deserving.  
Yajnavalkyasmṛiti – 1-317
216. Of what use is the lineage of a person without nobility of character? Don't insects breed even in fragrant flowers?  
Chaturvargachintamani - 342
217. The Sun cannot be illumined (as he is the source of illumination);  
The earth cannot be supported (as it is the primeval support);  
Likewise, the noble strive for the good of others without expecting any return.  
Subhashitam -46/77
218. The learning of the vainglorious out to stall the progress of others is like the elephant just out of the waterpond, pouring earth on itself.  
Chaturvargasangraha: 1/6
219. The mind of the noble softens in prosperity and hardens in adversity like the leaf of a plant; tender in spring and hard in winter.  
Drushtantakalikasatakam - 37
220. Friendship generates itself by mutual help among the common people, by occasions in animal and birds, through fear and avarice in the case of the stupid and by mere mutual sight among the good.  
Panchatantram - 37
221. He whose home is visited by the noble seeking help, is indeed gentle, fortunate and blessed.  
Panchatantram –1/110
222. Depending on Fate without making any effort generates nothing. He would be like the dummy lion of the palace on which the crow perches.  
Yasastilakasampoo –3/5
223. Desiring luxury without money, indulging in quarrels though indecent, engaging in argument with little knowledge – these are the three ways of the stupid.  
Subhashitamanjari- 188/175

224. However scholarly a person, he should not speak slightly of others in an assembly. Though sometimes true, if it causes distress, it should not be spoken. Neetiswishastika -4
225. The burnt of the battle is borne by the fighters outside but the fruits are enjoyed by the crafty insiders who are close to the king. The tusks of the elephant struggle to earn the food, which is chewed and enjoyed by the teeth inside. Yasastilakasampoo- 3/274
226. Neither the generous nor the stingy has the desire to enjoy his wealth. It is only meant for the enjoyment of others. Yet, look at the great difference between the two! Subhashitasudhanidhi- 160/4
227. Why other artificial ornaments for one who has modesty as the crown of precious stones, learning as the earstuds and charity as the armlet? Bharatamanjari- 4/356
228. The food that is cooked in the morning gets rot by the evening. How can the human body which is fed on this be fresh and eternal? Garudapuram- 11/11
229. There is no greater crime than indiscriminate dispensation of astrology, legal affairs, atonement and medicine. Bruhatparasasmruti - 8/83
230. Expertise in insinuation, lack of effort in self-improvement, hatred of meritorious people these three are unfailing roads to disaster. Subhashitasudhanidhi- 180/13
231. Even dust is better than one who doesn't react when shamed; just, when trampled, rises to settle on the head of the trampler. Sisupalavadham- 2-46
232. Proper dispensation is the only justification for earning; water outlets are the only ways of protection to the overflowing tanks. Hitopadesa-1/54
233. The existing value system, dispensation and social order should be maintained at all cost by the conquerer. Yajnavalkyasmruti – 1/343



234. Listen to and practice Dharma, the essence of which is not to inflict on others what hurts oneself. Panchatatram- 3/102
235. How can the power of the moon and the star help one who has neither the physical nor the mental power?  
Yasastilakachampoo- 3/54
236. The tongue has been tainted by unearned food the hand has been tainted by indiscriminate acceptance; the mind has been tainted by thoughts of other women. How can one expect peace and tranquility in Kali Yuga?  
Subhashitamanjari- 412/175
237. It looks as if only the honest and straight forward people are ordained to suffer; just as only the upright trees are cut; not the crooked ones. Yasastilakachampoo – 4/144
238. Valour without weapons is useless like the learning without expression. Yasastilakachampoo- 3/276
239. Without human effort no achievement is possible; food may be available but the hand should take it to the mouth.  
Subhashitamanjari- 499/540
240. Only charity begets love; the calf turns away when there is no milk in the udder. Panchatantram – 2/53
241. It may not be construed that a surgeon is cruel; it is in fact his compassion that makes him so. Subhashitamanjari –247/101
242. With a single male cub the lioness rests happily; the donkey on the other hand, bears the burden though with ten calves.  
392/95
243. Woe be to the man uncharitable; even animals are better, for they serve even after death. Subhashitamanjari- 436/274
244. The chariot and the horse cannot be without each other; like learning and dedication. Atrismruti- 2/14

245. One who has attained power but remains unhelpful is like the cloud which soars high, yielding no rain.  
Hariharasubhashitam- 3/39
246. The occurrence of happiness and sorrow is but natural and inevitable. The hair that is nourished by oil is also tonsured from time to time.  
Drushtantakalikasatakam- 47
247. Judicious offering to a deserving person at an appropriate place and time yields meaningful results like a drop of water that falls into an oyster shell at an appropriate moment to turn into pearl.  
Subhashitasudhanidhi- 28/11
248. When the ignoramus proclaims from the housetop, the ignorant people will give an ovation to the point of creating confusion even among the learned.  
Subhashitasudhanidhi- 33/7
249. Death is but natural, life itself is accident and so, one is fortunate to live even for a short time.  
Raghuvamsam- 8/87
250. After a long suffering, even a little happiness is like a great bliss; having tasted bitterness, doesn't even water taste sweet?  
Drushtantakalikasatakam- 21
251. Purity calls for rejection of forbidden food cultivation of friendship with the good and involvement in righteous action.  
Atrismruti - 1-39
252. One need not attend the meet, but having attended it, he should be righteous. He should neither keep quiet nor distort truth.  
Manusmruti -8-13
253. Don't advise when not solicited. Don't advise if the intentions are bad. The wise feign ignorance in such situations.  
Manusmruti -2/10
254. The unwise may feel total loss by the demise of a near and dear. The wise, on the other hand would consider it liberation.  
Raghuvamsam- 8/88

255. Garuda, the holy eagle, and the serpent are bitter enemies by birth and the serpent is always the loser. The serpent, in the arm of lord Siva as bracelet has enough impunity to ask of the welfare of the holy eagle! Likewise, the mean in high places look down upon the great.

Subhashitasudhanidhi- 176/3

256. It is amazing that even those who have no ties of family and wealth do not develop the aptitude of renunciation.

Sooktimala- 151

257. One should not make fun of the handicapped, one distorted, the ignorant, the illiterate, the aged, the ugly, the impoverished and the low-born.

Manusmruti – 4/141

258. Happiness and sorrow can be measured thus: self dependence is happiness.

Manusmruti- 4/159

259. Sin cannot be washed away by fasting. It only dries up inner flesh and blood.

Mahabharatam – 3/200/102

260. The egotism of valour flexes the muscle; the egotism of handsomeness makes one look into the mirror always; the egotism of lust makes one go after women, but worst than all, the egotism of wealth makes one born-blind.

Kalavilasa 6/6

261. Charity, bravery, meditation, power, truth, dharma, control of the senses, control of the actions, good character, cleanliness lead one to success and good fame.

Ramacharitam- 24/102

262. Dharma does not show off externally like the stem of a plantain tree; rather, like the root of a jackfruit tree, it lies dormant and puts forth its fruit. Sabharanjanacharitam- 83

263. When even touch, sight and spoken word comes out of the melting heart, it reveals true affection. Prasangabharanam - 27

264. He who approves slaughter, he who slaughters, he who cuts the animal into pieces, he who sells it, he who buys it, he who cooks it, he who serves it and he who eats it – these share the sin of cruelty.

Manusmruti – 5/51



265. The wise do not praise bravery for mere bravery, but they do when it is combined with morality, just as eloquence is praised when it is combined with wisdom. Sabharanjanasatakam- 50
266. The frog that is caught in the mouth of a serpent, itself keeps swallowing the small insects that approach its mouth. Similarly, the man who is blind by ignorance, though caught in the jaws of death, keeps going after sensual pleasures.  
Prabhodhasudhakara - 64
267. Those who are unruly in conduct, those who are scandal-mongers, those who have enjoyed themselves at the cost of Dharma, even the blessing of such people is a curse.  
Subhashitaneethi -4/8
268. The mean will look only for defects even in the profusion of good qualities. The pig searches only for bog even in a lotus lake.  
Kavitaamrutakoopam- 18
269. The wise-one looks at the achievement, not at intentions, thoughts or objectives.  
Subhashitamanjari - 310/71
270. Childhood, like old age, leans on other's help. Only youth is the essence of life-that too when it is not bereft of discrimination.  
Sooktimala- 801
271. The effort at attaining the impossible results in being dubious. The crow's effort to walk like a swan ends up not only in not being able to do so but also in forgetting its own walk-style.  
Nityaneeti- 360
272. Faint voice, failing mind, trembling body, extreme fear are characteristics of death, also of begging.  
Kavitaamrutakoopam- 45
273. Not suddenly undertaking any responsibility is a characteristic of the human mind. Seeing that what is undertaken is completed successfully is another.  
Narabharanam- 153
274. Enmity ends in death, youth in giving birth, anger in love and self-esteem in supplication.  
Narabharanam- 220

275. One should till the soil with some expectations, should trade being ready for profit or loss, lend money without expecting it back and adventure being sure of death. Narabharanam- 280
276. Charitable disposition, soft-spokenness, intelligence and propriety, these cannot be learnt; they are but natural gifts.  
Subhashitasudhanandalahari- 79
277. While the words of the good and wordly people follow meaning, meaning comes rushing to fulfil the words of the rishis and the sages.  
Uttararamacharitam- 1/10
278. Like the seed in the fruit, the inborn tendencies of the low are hidden for some strange reason. Ascharyachoodamani- 2/4
279. That which shines from natural splendour does not require polishing. Whoever has washed the moon clean? Who has ever polished the Kaustubha diamond?  
Ascharyachoodamani- 3/24
280. Being witty as to cause pain, exhibiting good behaviour only as long as it is possible, remembering only bad incidents, these are characteristics of false friendship. Neetidwishashtika- 41
281. An unassuming scholar should be cultivated; one should be watchful if he is ill-tempered. One should be compassionate to a straight-forward idiot. Ill-tempered idiots should be discarded.  
Neetidwishashtika- 54
282. In order to rise high, one bends too low. In order to live well, he suffers. In order to be happy he is always miserable. Who but the most servile be as thoughtless?  
Neetidwishashitkanubhandha- 18
283. Discrimination is one eye. Good company is the other. He who does not have these, swiftly sinks into the well of delusion.  
Chanakyaaneeti – 2/90
284. The stingy could be won over by money, the stiff with humility, the stubborn with implicit following, and the learned by straight-forwardness.  
Chankyaaneeti –3/159

285. Even insignificant help rendered to a good person expands like a drop of oil in water. But the great assistance rendered to the mean-minded congeals and disappears as ghee poured into snow.  
Chankyaneeti – 3/38
286. What a similarity there is between the mridangam the percussion and the hypocritical people! Just as the percussion instrument sounds well as long as it is smeared by paste, the lowly speak pleasantly only as long as they pampered.  
Subhashitamanjari – 305/7
287. There is nothing special in being nice to the helpful; the wise say that only he who is nice even to the harmful is noble.  
Neetisastram- 214
288. After a rash deed is done in haste, what is the point of consulting a wise man for advice? After the wedding is over, what is the use of enquiring after the auspiciousness of the moment?  
Abharanasatakam- 89
289. One should match the desires to resources; one should stretch the foot to the length of the covering. Abharanasatakam- 102
290. Just as migratory birds perch on a tree for the night and fly away in the morning, all meetings of living beings certainly end in parting.  
Buddhacharitam – 4/46
291. Enmity has no end at all; but if one kills his own anger, it destroys enmity.  
Avadanastakam- 371
292. Scholarship and mundane power cannot be equated. While the king may be respected only in his own kingdom, the scholar is respected everywhere.  
Panchatantram- 2/58
293. Fruit-bearing trees bend. Genuine scholars bow down in modesty. But the dried sticks and idiots don't bend, they break.  
Nityaneeti - 62
294. Melody, clarity in enunciation, correct division of word and syllable, proper accent, confidence and rhythm; these six are the merits of a reciter.  
Panineeyasiksha- 33



295. The ignoble people know only to ruin the effort of others, never to help them. The wind has strength only to fell a tree, not to raise it.  
Panchatantram- 1/315
296. Even a chopped off tree sprouts again. The waning moon will surely wax. So knowing, the wise do not lose heart in sorrow.  
Neetisatakam - 79
297. The sun is copper-like in colour both when he rises and when he sets. Likewise, great people remain the same in fortune and in misfortune.  
Narabharanam- 26
298. If one's face is the home of composure, heart is filled with kindness, speech is honey-sweet and senses and mind are geared to help others, he is universally respected. Subhashtiam- 47/103
299. One is power who is forgiving and the one in poverty who is generous occupy a place better than the Heaven.  
Sarngadharapaddhati- 1550
300. Where all the leaders, where all are over-proud, where everybody hankers after greatness, there everything is bound to decline.  
Nityaneeti- 233
301. What is death? Stupidity! What is invaluable? That which is given at a needed moment! What is it that causes pain till death? Concealed sin!  
Prasnotthararatnamalika-4
302. A lion cub does not hesitate to spring on the forehead of an elephant in rut. That is the way of the valorous. Their valour does not depend upon their age.  
Neetisatakam- 75
303. One should rather desist from earning for its own sake, than earn only to give in charity, likewise, one should shun filth instead of going into it just to wash oneself later.  
Mahabharatam- 3/95/6
304. Gods do not protect with a staff as a cowherd does. They give wisdom to one whom they want to protect.  
Chankyaneetisaram- 6/37

In whatever manner the evil people trouble the good, like an ash-smeared hand rubbing against the mirror, the good people shine with increased splendour.  
Vasavadatta- 9

305. That which everybody likes to know, by doing which no one is ashamed, and by which the mind is contented and happy, that only is good. That is the true character of purity.

Manusmruti- 12/37

306. That which destroys vanity is Vidya-true knowledge. That which satisfies the needy is true wealth. That which is true to Dharma is wisdom.

Darpadalanam-3/3

307. In childhood one is unrestrained. In youth, one indulges in pleasures. In old age one should become tranquil. But the purpose of one's entire life is to do good to others.

Kittineematam- 724

308. Even the displeasure of a good man is beneficial like medicine; not the friendship of an evil person. His association should be cut off like a finger bitten by a snake.

raghuvamsam- 1/28

309. He who hankers after pleasures without money and he who is angry without power will never be happy.

Sarngadharasmruti - 1548

310. With the help of a log of wood man can cross the river. While doing so, he carries the log, just as he is carried across by it.

Mahabharatam- 12/138/62

311. Only the great and the noble should be cultivated, as taking shelter under a large tree of leaves and fruits. By chance even if there is no fruit, none can prevent atleast the comforting shade.

Hitopadesa- 3/10

312. Cats and dogs are made to dwell within the palace. But the elephant is chained outside, without demeaning it.

Subhashitam- 231/59

313. Who is blind? One who does the evil. Who is deaf? One who does not listen to the good. Who is dumb? One who does not speak good at the right moment. Neetiswishashtika- 33

314. The evil person, even when gets a good thought it may bring only misery to the pious; just as a tiger undertaking a holy fast, only to become more and more hungry for the cow.

Narabharanam- 46

315. Genealogy, wealth, learning, good appearance, courage, altruism, penance – these seven are mainly the cause for pride among men.

Darpadalanam-1/6

316. One should leave the place if he can not find employment one should give up the employment which is fraught with difficult with difficulties. One should give up a deceitful friend. One should give up wealth that endangers life.

Subhashitam- 153/29

317. Helpfulness, pleasant speech, cultivation of genuine friendship – these are the primeval nature of the cultured. The moon is cool because of its own innate qualities.

nalachampoo- 3/14

318. The learning that is confined only to books, the wealth that is in others' hands, the army stationed in the city during war, these are unproductive.

Narabharanam- 219

319. Wealth is the follower of truth; fame is the follower of sacrifice; knowledge is the follower of pursuit and wisdom is the follower of Karma.

Subhashitam- 157/188

320. Good health, sound body, freedom from debt, sinlessness, independence, lack of worry and unassailable belief in God – if these are present, it is Heaven itself.

Nityneeti- 157

321. Good behaviour and sound character, like the creeper bedecked with flowers, and speech of sound sense, always bring wealth.

Rasagangadhara- 191



322. There is nothing unsurmountable for the capable. There is no distance for the hard-working. No country is foreign for the learned. There is none strange for the soft-spoken.  
Hitopadesa- 2/12
323. He is the true householder whose home is visited by relatives and guests from afar. The rest are but house guards.  
subhashitasudhanidhi- 31/2
324. A contemplated action should not be publicised as it may not be possible to carry it through.  
Nityaneeti- 208
325. The evil that one does is repeated by others. In the world, imitation is the fashion. Discriminatory good actions which are self-inspired are not in vogue.  
Nityaneeti- 215
326. Non-crookedness is the primeval quality of Dharma; non-ambiguity that of Artha; non-attachment, that of Kama; and non-rebirth, that of Moksha.  
subhashitavali- 2643
327. One should never be a person who is brilliant and compassionate. By harsh striking even the sandalwood emits fire.  
Subhashitavali-2655
328. One who is after prosperity should eat what he can chew, and chew what he can digest and digest only that which is good for him.  
Subhashitavali-2740
329. What is wrong with the water-bearing cloud which is black, and what is good at all of the dry autumn which is white?  
Subhashitavali- 2796
330. One should not strike hard a person who is weak and dull. Even a static stone when struck, emits sparks.  
Subhashitavali- 2798
331. A broken thorn in the foot, a loose tooth in the mouth and a crafty minister should be mercilessly uprooted.  
Subhashitavali- 2805
332. A person who suddenly occupies a high office loses discrimination like the one on the summit seeing the landscape around as smooth and even.  
Subhashitavali- 2857

333. To be complacent, feeling that he is complete with many qualities, is to live under illusion. It is the full moon which is struck by the eclipse. Subhashitavali- 2873
334. Many a time it is the soft but not the harsh that can win the game. The falling soft water can cut through the mountain but the hard sword cannot. Subhashitavali- 2875
335. What is the use eloquence over a dull mind? What is the use of her, casting charm before the blind? Subhashitavali- 2888
336. It is the intention that is important in action. Kissing the consort is so different from planting a kiss on the daughter. Subhashitavali- 2966
337. Just as light and shadow are inseparable aspects so are the man and his actions. Subhashitavali- 3080
338. Who has assured a hundred years of life to the newborn? It is by tact and persistence that longevity is earned. Subhashitavali- 3086
339. Face is wrinkled, head is grey, body withers away and still the desires are youthful. Subhashitavali- 3242
340. The longing of others is reflected in the consciousness of an individual according to his own mind. The reflection of the face in a sword is but lengthwise. Sooktimala- 548
341. One should not go empty handed to see the king, God, preceptor, priest, son and friend. A gift could always beget a gift. Sooktimala- 649
342. That which is sweet should not be eaten by a single man alone. When everyone is sleeping, an individual alone should not be awake. A man should not walk alone. Similarly a single man by himself should not make monetary decisions. Sooktimala- 620
343. The wound caused by the arrow heals; the axed forest tree sprouts again; but the wound in the mind inflicted by hurting words will never heal. Mahabharatam - 104/33

344. No shastra is more valuable than the Vedas; no preceptor greater than the mother; no gain better than Dharma and no penance more effective than fasting. Mahabharatam- 104/65

345. If at home there is no consort who speaks soft and is devoted, it is better for the man to go to forests, for, there is no difference between the home and the forest for him.

Mahabharatam- 144-17

346. Both ambrosia and poison are in our own body. Man embraces death by falling a victim to indulgence but attains immortality by steadfastly following truth.

Mahabharatam- 175/22

347. Saraswathi, Goddess of learning, becomes his who selects and collects precious words of wisdom from the learned.

Nityaneeti- 354

348. One who has not acquired a collection of Subhashita-capsules of wisdom-what can be offer during conversation, commerce or discourse?

Panchatantram- 2/174

349. Doing something impossible and not doing something possible and disclosing whatever is going to be done without sufficient thought input. These are all irresponsible act - Viduraneeti

350. There are ten rules to be followed by each and everyone. They are known as yamas and niyamas. *Ahimsa, satyam, asteyam, brahmacharyam, aparigraham, soucham, santhosham, thapa, swaddhyayam, eeswara pranidhanam* are the ten rules.

351. let us her good, let us see good, let us do our mission oriented divine work of serving the god's creations and all human beings as long as we are alive. Let us work together, let us share the work results together, let us get ourselves enlightened through cooperation, let us not have hatred towards anyone, let noble thoughts come from all over the world. Vedic mesages.

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## THE SCIENCE OF CUSTOMS AND RITUALS IN HINDU DHARMA

What is the definition of a Hindu? : *Aa sindho: sinduparyantham yasya bhaaraatha bhoomikaa maathru bhoo: pithru bhoo (punya) shaiva sa vai Hindu iti smruthaa:* whomsoever, is considering the land between the sapta sindu ( Indus valley river) upto Indian ocean as the motherland/ fatherland and holy land, is known as Hindu. This land is known as *Hindustanam* which is defined as follows: *Himaalayam samaarabhya yaavath hindu sarovaram tham deva nirmitham desam hindustaanam prachakshate.* The land created by god himself and which is lying between Himalayas and Indian ocean is known as *Hindustanam*.

Unlike other religions, Hindu dharma has many specialties. This is not known as a religion, it is known as the dharma. Either *Hindu dharma* or *sanaathana dharama*. *Sanathana* means according to *bhagavath geetha*, which cannot be destroyed by fire, weapons, water, air, and which is present in all living and non living being. Dharma means, the way of life which is the 'total of all aacharaas or customs and rituals'. The aacharaas which are to be performed by the mother is known as *mathru dharma*, those of father is known as *pitru dharma*. Similarly there are *putra dharma* ( dharma of son) *aacharya dharma* (dharma of teacher), as a continuation we can say *bhraathru* (brother) *dharma*, *bhagini* (sister) *dharma*, *poura* (citizen) *dharma*, *raja* (king) *dharma* and so on. All these dharmas have been described in detail giving the specific importance in the *dharma saastra* and *smruthies*. There is no specific English word for dharma, but it is the sum of the duties + responsibilities + privileges of that individual. Then what is the *sanathana/ Hindu dharma*? It is the total of *mathru dharma* + *pitru dharma* + *putra dharma* + *putree dharma* + *acharya dharma* + *poura dharma* + ... + ...etc. Hence we say Hinduism is not a religion but the way of life.

One should always remember that in each and every aachaaraas / dharma there will be a component of spirituality in it. Without spirituality, nothing exists in Hindu dharma. Almost everyone carries a wrong impression that this spirituality is religion. No ! spirituality is different in Hindu dharma, where the question a religion does not exist at all, because Hindu dharma was not created by one individual/ prophet/incarnation/.... Hence it is not a religion. Spirituality is a part of every Hindu custom.

What are the rules to be followed while practicing the Hindu customs and rituals (aachaaraas) ?. This question has to be scientifically analyzed. Whatever may the aachaaraas we are practicing in our life, it has been told that *saakshaath anubhavairdhrushto na srutho na guru darsitha lokaanaam upakaaraaya ethath sarvam pradarsitham*. Aachaaraas are to be followed based on their merits available from the self experience, one need not blindly follow a teacher or someone who gives advise without reasoning. All these aachaaraas are mentioned for the prosperity of the human beings and it should be the prime focus for practicing the Hindu aachaaraas.

*Achaaryaath paadam aadatthe paadam sishya swamedhayaa paadam sa brahmachaaribhya sesham kaala kramena cha* is another important advice given in smruthies. It means one can get one quarter of the knowledge from the teacher, one quarter by analyzing oneself, one quarter by discussing with others and the last quarter one can get during the process of living by the method addition, deletion, correction and modification of already known aachaaraas/ new aachaaraas.

It is mentioned that we have to take one quarter from the teacher/ guru. Now, what is the definition of a guru or teacher. *Aachinothi cha saastrarthaan sishyaan saadhayate sudhee swayam aacharti chaiva sa acharya iti smruthaa:* who is knowing the scientific meaning of the purpose of the aachaaraas, who can teach the student very systematically and who is following (all what is taught to the students) in ones own life, that person is fit to be called as the

teacher/guru. Here, one can see the qualification of a teacher who can define and explain about the aacharaas.

Can we practice the aacharaas at all times with the same level of devotion? This is a common question asked. The answer is also given in our smruthies. *Swagraame poornam aaacharaasasm anya graame thadardhakam pattane tu thath paadam yaatre baalaad aaacharaasastheth*. In one's own village, practice all the aacharaas, in other villages (while travelling or staying) practice one half of the aacharaas, in the cities/towns follow atleast a minimum of one quarter of them and while traveling, like a child one need not practice any of the aacharaas.

Should we practice the aacharaas blindly saying that those aacharaas were followed by my father or forefathers.? *Thaathasya koopoyam iti bruvaana kaa purusha kshaarajalam pibathi*. Saying that this well was dug by my father (and for showing respect to him) one need not drink the salt water (if it is present) in the well.

Aacharaas need not be the same in Kerala and Kashmir, similarly for a Hindu the same customs cannot be practiced in America and Rajastan desert. Hence depending upon the place, time, season, age, availability of the materials, financial position of the individuals, the aacharaas can be duly modified.

The same principle one can see in bhagavath geetha also. Lord Krishna told Arjuna in the end of Bhagavath geetha, that *vimrusya ethath aseshena yathaa icchasi thathaa kuru*: Hey Arjuna all those whatever I have told you, critically analyze, and the option for accepting or rejecting is yours.

These are the rules one should follow while analyzing and practicing the aacharaas in Hindu dharma. There are many words of guidance given in dharma saastra book. *Saastram pramaanam* : scientific results are the first basis, *aapta vaakyam pramaanam* : guidance to be taken from the scholars is the (next) basis, *prathyaksham pramaanam* : the direct experience is the next basis, *anumaanam pramanam* guessing the consequences/results, if none of the above



parameters is available. These are the steps one should select for the analyses of the aacharaas.

What are the purposes of practicing the aacharaas ? It has been described in the smruthies ( which are also known as dharmasastras) : *aacharaath labhathehyaayu: aacharaath dhanamakshayam aacharaath labhathe suprajaa aacharo ahanthya lakshanam* . By following the aacharaas one gets health and longevity, it leads to prosperity, it gives social relations and friends, and the followers of aacharas are considered as the embodiment of nobility. *Aachaara heenam na punanthu vedaa:* The person who does not have the habit of practicing the good *uchaaraas*, cannot even be purified by Vedas.

What are the aacharaas ? those customs and rituals which are irrelevant in the modern times are known as *anaacharaas*, those which lead to negatives/ deleterious results are known as *duraacharaas* and those *aacharaas* which give very positive and useful results are known as *sadaacharaas* or generally known as *aacharaas*.

The sadaacharaas are followed for, any one or more of the following purposes in the Hindu dharma. **The aacharaas are those give psychological, physiological, family relation and bondage, social relations and bondage and national integration based positive results.** Focusing on the above five points one can analyze very systematically all these aacharaas.

**Psychologically beneficial aacharaas/ customs and rituals:** Few examples are selected for explaining these type of aacharaas. The morning and evening prayer, the positive songs and *keerthans*, the Vedic *mantras* which produce psycho linguistic and neuro linguistic effects, etc are psychologically useful aacharaas. They give extremely good response in the brain cells by way of producing curative hormones. The blessings of the elders and parents, the encouragement given to the children and also to those who are desperately struggling in the life, the words of consolation, the blessings

like *vijayee bhava*, the *aachaaraas* in social gathering and family functions, etc give psychologically positive results. (All these *aachaaraas* are also spiritually connected, is the Hindu way)

**More examples:** Reading a *puraana* gives the messages of ups and downs/ failures and success/ pains and pleasures in the life. The stories of Sri Rama in *Ramayana* and that of Pandavas in *Mahabharatha* inform us that there are sufferings in the life and everyone should face them boldly. Reading *Bhagavath geetha* is for mentally preparing to face any type of consequences and without failure practicing the *swadharama* (ones own duty). Through puranic story telling for the children, value based messages are given in the form of story capsules to remain in the memory for many years and to get the reminder whenever the abnormal pathway is opted to in their life. Visiting elders on festive occasions is for getting value and experience based advise from their life. Respecting teachers and elders, is for keeping the values in ones life and in society for the learned people who continue to guide the society. Auspicious time selection for visits and performing ceremonies, is to take extra mental precaution to see that everything is carefully / systematically programmed and planned. Consulting a good astrologer is to see that things are meticulously planned and the blessings of the Vedic devathaas are assured for an optimism in ones endeavor (however this should not go to the level of superstition and should be carefully monitored). Performing *pooja* is mainly to see that good will come if good is practiced. And to give the feeling that rest is left to the divine mercy/ blessings. This blessing is directly assured (at least we feel so) by conducting *poojas* in presence of family and relatives (hence gives an opportunity for the family members to come together also). Worshiping the idols/ images having smiling faces (*prasanna vadanam*) gives a psychological positive feeling of confidence (avoid the worship of weeping/ bleeding/ cruel images as it gives a negative influence in the mind). Chant positive *manthra/ keerthan/ bhajan* for positive effect (neurolinguistic and psycholinguistic) and never chant

crying or weeping songs which also influence the mind negatively

**Physiologically beneficial customs and rituals.** You can also analyze these customs and rituals yourself on the scientific base. The *soorya namaskaara* / sun salutation performed in the morning is a combination of 7 yogaasanaas practiced in ten steps, which give smooth exercise for all the movable skeletal joints in the body and hence this is also known as 'the king of the exercises'. Morning prayer *karaagre vasathe lakshmi karamadhye saraswathi karamoole sthithaa gouri prabhaathe karadarsanam*: Sitting in the same bed where you sleep everyday, without cleaning the teeth-face-body, why this manthra is chanted, because the body was horizontal for the whole night while sleeping and it is going to become vertical ( suddenly) when you get up. In the vertical position of the body the force exerted by the heart for pumping the blood is more, hence the change of position of the body from horizontal to vertical level should be slow and steady. Hence we are instructed to sit on the bed for few seconds ( it has been statistically estimated that 23% of the heart attack deaths take place in the heart patients when they suddenly get up and stand/walk from the lying position ). Similarly with a mantra we touch the floor *samudra vasane devi parvatha sthana mandale Vishnu patnee namasthubhyam paada sparsam kshamaswa me*. The bio static electricity in the body gets earthed through the fingers instead of the feet, reducing the chance of arthritis and many other nervous based disorders. Before taking the food, few second prayer is a Hindu aacharaas. during this prayer time and while looking to the food the flow of saliva in the mouth takes place and this liquid activates the generation of other digestive enzymes also, thus activating the process of digestion ( a layer of saliva and digestive enzymes in the bottom of the stomach before the food comes to the stomach is a biochemistry). Fasting leads to cleaning of the intestine, certain fasting (partial) in which change of food is instructed in the custom, which leads to getting variety of micro nutrients from different types of food sources. *Choodaakarna* the ceremony



connected with wearing of the ear ring is just like giving the first vaccination and *annapraasana* the first food giving ceremony is like the first inoculation to the baby through the hands of different people (the ear ring in the former and food in the latter carries little dirt/germs which leads to augmenting the immunity in the body of the baby). These are only very few among thousands of *aacharaas* practiced by Hindus, for physiological benefit

**More examples:** Do not keep the direction of the head towards north because the magnetic meridian of the earth retards the blood flow through brain capillaries and affect the functioning of brain cells. Avoid taking bed coffee to prevent the obnoxious decomposed materials generated by microorganism in the mouth ( in the night ) going to the stomach to avoid the chance of stomach cancer. Wake up early morning, because the brain is perfectly active during that time. Take a bath in the morning itself so that all the decomposed products/ salts/ urea etc present on the surface of the body gets cleaned which prevents the skin diseases significantly. The cold water/ hot water bath activates the biological process of the body cells to maintain the body temperature when cold/ hot water bath is taken. *Dhyaana* / meditation activates brain cells. *Praanaayaama* activates the lungs cells and functioning. Taking *thulasi* water/ *theertha* gives the medicinal property of the plant in it. Using sandal wood paste in the forehead gives the chance of absorbing the medicinal components in the *chandan* through the most sensitive part of the body. Visiting a temple ( in Hindu worship, the temples are not merely prayer halls, they are quantum healing centers) gives energy to the body if *pancha suddhee* is maintained. Doing *pradakshina* to *aswatha* gives an atmosphere/ air through which traces of ozone produced by the tree goes to the lungs and purifies the lungs. Attending and participating temple festivals give the opportunity for leadership qualities, social gathering, entertainment and hence variety of merits including spiritual benefits.

**Customs and rituals beneficial for strengthening the family**

**bondage:** When we look for integrated development of the society, the family relation becomes the first step in the social life. There are hundreds of *aacharaas* in the *Hindu* life which are exclusively aimed at strengthening the family relations and bondage. Every spiritual and family based customs are to be practiced by the wife and husband together, This strengthen the family relationship. The message that *maathru devo bhava, pitru devo bhava* : Let the mother and father be divine to me ( gods to me) convey a strong relation thread between the children and parents. The death anniversary functions known as *sraardha* are mainly performed to give the demonstration of the relationship between the parents and children. The demonstration from generation after generations.

In all the rituals, the individual is expected to tell the *gotra* (clan) and *sootra* (thread of connection) which again show the connection with the forefathers. During festivals, the parents were saluted/ prostrated as *mathru/ pithru namaskaara*, to get the feeling for the children that ( whatever may be their age) their relationship, with the parents is not merely that of people living together in a house. This gives the message that in younger days children were looked after by the parents and in the old age, the parents should be looked after by the children with due respect and care. Similarly the relationship between the wife and husband is not merely the relation for sex, but for building a family with culture and values in the life. Through 16 sacraments known as *samskaaraas* ( *samskaara* means refining or purification) the life of the baby is getting enriched by the values of the life. During the construction of the house the ground breaking, stone laying, the door fixing and house warming ceremonies are all connected with the star of birth of the wife, thus giving importance to the wife in the family. Without the husband or wife, the other (among the couple) alone cannot perform any of the household *acharas*, which again makes it compulsory to build the strong family bondage. The marriage is performed by tying the thread- putting the garland- holding the right palm (*paanigrahana*)- presentation of the cloths or exchanging the rings- and by *sirrodhaara*, these five rituals in presence

of hundreds of invited guests/ and agni/fire give the feeling of strong wife – husband bondage. It is said that the marriage is conducted as agni saakshi. Thus one can analyze the customs to understand the impact of the family relations.

**More examples:** If properly performed matching a horoscope before marriage gives an opportunity for understanding the personality of the individuals who are getting married and suitable corrective measures can be adopted. Inviting relatives and guests for marriage gives an opportunity to share the joy among relatives and social and family relations get strengthened. After marriage ceremonies are aimed at getting a healthy baby and giving the feeling of love and affection among the couples. The *jaatja karma* of the baby is performed to record scientifically the position of the celestial body when the baby was born. It is the bound privilege of the parents to give the name for their baby and hence the name of their choice through *naamakarana*, is given as a part of the *samskaaraas*. *Dhampati pooja*/ couple pooja is performed by other family members to remind their respect and appreciation on strengthening the bondage between the couples. Birthday celebrations are conducted to inform the duty and responsibility of the individuals when they grow and to remind them that the society and relatives are with them for undertaking the responsibility. Celebration of the 60<sup>th</sup> birth anniversary (*shashtipoorti*), to remind the time for doing more good for the society using the experience gained for the last 60 years of life, when the period of rest starts.

**Customs and rituals beneficial for the social bondage:** Inviting guests for family functions like birthday, marriage, during the death and after death rituals, getting together during the festival seasons like holi-deepavali-krishnaashtamai-ramanavami- celebrations etc. temple festivals, village festivals, are all aimed at building social bondage . Through these social relation building mechanisms the cultural relationship among Indians was built up for the last many millennia . Many spiritual and religious activities as *samooha pooja*, *samooha bhajan*, *mantra aalapan* etc are all done in groups with



the leadership of the common Hindus themselves, not through appointed priests, which lead to the cultural integration of the social bondage in the Hindu society.

**More examples:** Family visits during happy and unhappy occasion by relatives and friends (even without taking appointments) is to confirm the family members that during happy and unhappy incidents in one's life we, the relatives and friends will be with them. Get together during festival occasions is for strengthening social bondage among the society members. *Kumbha mela*, *vaisaaki*, and many other festival is for sharing the joy and forgetting the negatives of the past and to build better relationship among the members in the society. Group pilgrimage to long distance is to share the joy and difficulties together in the spiritual way to strengthen social bondage...

**Customs and rituals beneficial for national integration:** There are many customs which are followed exclusively for getting the feeling of patriotism among the Indians. The morning prayer (*prathasmarana*) we chant the names of seven holy rivers from Indian continent ... *gange cha yamune chaiva*... and seven mountains.. *mahendro malaya sahyo*... the great women of India... *ahalya droupadi seetha*... the great men *aswathaama bali vyuaso*.... Seven major cities of India *ayodhya mathuraa maaya*.... and so on. These stanzas were written three or four thousand years ago. This informs and reminds us that India was culturally one for the last many thousand years. The pilgrimage to north India by the south Indians and to south India by the north Indians are fine example of national integration. The customs followed in the immersion of the ashes (obtained after cremation) in *kaasi / varanaasi triveni sangam* by the south Indians and in *kanyakumari triveni sangam* by the north Indians lead to this national integration through visits and experiences of direct contact among south and north Indians (where the languages/ food/ dressing/ cultural traits etc differ).

It is also important to note a very interesting fact, that for making any curries (food items) in south India, north Indian spices are required and for north Indian curries, south Indians spices are inevitable. Thus

even in kitchen of Hindu family, the national integration can be seen. Learning of Sanskrit language, chanting of Vedas and related literature, the story of Ramayana and Mahabharatha are all finally aims at integrating the people of India and give the message of unity in diversity.

**More examples:** A deep analyses of the holy places, rivers, mountains and asramas given in Ramayana and Mahabharatha when Sri Rama ( in Ramayana) and Pandavas ( in Mahabharata) visited during vanavaasa, give familiarity of the nation through itihisas and puraanaas. Puranic stories do influence the national integration. Pilgrimage to Asrams, Gangotri, Haridwaar, Kailash, Kanyakumari, etc integrates the mind of all Indians towards the nation. The concept of *athithi devo bhava* to serve the people who visits our home without taking appointment gives the opportunity to know and help others. During the age old customs anyone who is on pilgrimage has to depend for the food and shelter upon the unknown people. People traveling from north to south and south to north of India, for the pilgrimage could take the shelter in the *athithi devo bhava* concept. Bharath maatha ( mother Bharath) concept of the nation gives the relation among Indians as the children of the country. In mahasankalpa names of different kshetra in India are given ( as *parasurama kshetra* ( Keralam) - *Sri Rama kshetra* ( Tamil Nadu) - *Sreenivasa kshetra* ( Andra) - *Jagannatha kshetra* ( Orrissa) - *Bhaskara kshetra* ( Karnataka) and so on, which informs us that we are part of the great nation Bharath. Like this there are hundreds of the aachaaraas aimed at national integration.

Thus the aachaaraas are directly connected with the day to day life of Hindus. Even the spiritual rituals also compels us to pray *sahanaa vavathu, saha now bhunakthu saha veeryam karavaavahe thejaswinaavadheethamstu maa vidvisha vahai aano bhadraa*. Let us exist together, share the results of the work together, work together, thorough that path way let us enlighten ourselves, let us not have hatred towards anyone, let noble thoughts come from all over the world. Hindus always prayed *lokaa: samasthaa: sukhino*

*bhavanthu* . let everyone become happy. **Hindus never prayed**  
*haindavaa: samasthaa: sukhino bhavathu* Let (only) **Hindus**  
**become happy.** Hindus never said their pathway is the only correct  
one for attaining god. They always allowed other thoughts also to  
penetrate/integrate into the minds of the people, if those pathways  
can also fetch good results. Hindus are the only people who prayed  
*sarve bhavanthu sukhina: sarve santhu niraamaya sarve*  
*bhdraani pasyanthu maa kaschit dukhabaag bhveth.* Let *sarve-*  
all become happy and glorious, free from pains and sorrow. Here  
too Hindus never said only let Hindus get all the benefit

Say that all Indians are proud Hindus whether they follow  
lord Siva, Krishna, Jesus Christ or Prophet Mohammed, if their  
blood is Hindu blood then they are Hindus. In India there are  
only two categories of people who are Hindus and who were  
Hindus. Those, who are following the sanathana dharama,  
even though born and brought up under different culture  
anywhere in the world, are also Hindus.

## HINDU (VEDIC AND RELATED) LITERATURE

*Christianity is based on one holy book, the Bible and the Islam*  
*is also based on one book Koran. But the Hindu dharma is based*  
*on many books such as Vedas, Vedaangaas, Puraanaas, upa*  
*puraanaas, smruthies, upa vedaas and itihaasaas. Since human*  
*knowledge is so vast, it is impossible to comment on that heap*  
*of knowledge in one book. Hence the Hindu Rishies wrote*  
*thousands of books and commentaries under specific titles. A*  
*Hindu can select the subject(s) of his choice. We, in our earlier*  
*publications have scientifically explained the Hindu aacharaas,*  
*Hindu spirituality, scientific and technological heritage of Hindus*  
*and now, it is necessary that every Hindu should understand what*  
*are the Hindu literature, atleast in a nutshell.*

Hindu dharma is based on Vedas (the word Veda means knowledge).



Vedas are foundations of Hindu dharma. All other Hindu literature are directly or indirectly linked with Vedas. There are four Vedas. They are Rigveda, Yajurveda, Samaveda and Atharva Veda. Vedas are known as anaadi because their period of composing is not correctly known. The authors of these manthraas are known as manthra drushtaara, means those who could see the manthra when they composed them. Vedas are also known as apourusheya means composed by Rishies having the talent beyond the level of ordinary human beings. All these manthras are classified by Maharshi Krishna dwaipaayana, who was later known for his meritorious work as Veda Vyaasa who was born to a fisherwoman, into Rig Veda, Yajurveda, Samaveda and Atharvaveda.

### **ANALYSES OF VEDAS**

**Analyses of Rigveda:** Rigveda is the oldest book of the human race. It might have been composed many thousand years ago. It is composed by hundreds of Rishies and their names are given in the beginning of each sooktha. It is written in poetical style/language, known as Riks, The Riks (stanzas) put together becomes sookthas.. Rig Veda has 25 recensions of which only five are available now. They do not differ significantly. The available recensions are known as saakala saakha, baashkala saakha, aaswalaayana saakha, saankhaayana saakha and maandukeya saakha

*The most popular Sakala saakha of Rigveda has 64 chapters. Manthras are classified into 2024 Vargas which are made out of 10552 Riks. These manthraas are composed with a total number of 193816 Sanskrit words. There are 397265 letters in Rigveda. Some of the names of the Rishies who composed the Veda manthras are Kasyapa, Viswamitra, Kanwa, Paraasara, Gouthama, Bharatha, Vamadeva, Gopayana, Athreya, Aangeerasa, Bharadvaja, Sounaka, Gargya, Praagaatha, Vasishta, Yama, Samvana, and so on.*

**Analyses of Yajurveda:** More than one half of the manthras in Yajurveda is taken from Rigveda and remaining composed by

*Rishies of Yajurveda.* It is said that there are 100 recensions for the Yajurveda. Names of some of these recensions are: Aalambhi, kalinga, kamala, ruchaabha, aarunee, thaandya, syaamaayana, kata and kaalaapi. The Kata saakha has been further separed into charaka kata, aahwaraka kata, bhraajishtala kata, kapishta kata, chaaraayaneeya kata, praachya kata, swetha kata, swethaswethara kata, oupamanyava kata, paathaandineya kata, maithraayaneeya kata,..... and so on. The series go upto one hundred recensions. Few of the Yajurveda recensions have only poetical manthras and the remaining have both poems and prose. All the recensions which have only poems are known as Sukla Yajurveda and other set is known Krishna Yajurveda. All these recensions together is known as the tree of Yajurveda ( Yajurveda vruksha). There are 40 chapters in the Sukla Yajurveda recensions and in other recensions the number of chapters vary. The 40<sup>th</sup> chapter of Sukla Yajurveda is Eesaavaasya Upanishad, the only Upanishad coming as a part of any Veda

*Analyses of Sama Veda :* This Veda is chanted by specialists known as udgaatha, means musicians of vedic traditions, and the manthras are highly complicated music in nature. There are 1000 recensions for Sama Veda and only 13 are now available. Some of their names are: Raanaayaneeya, saatyamugra, Vyaasa, bhaguree, oulundee, goulguvi, bhanuman, kaaraatee, masaka, kouthuma, saaleehotra, jaimineeya, and soon. There are total 1861 manthras including 267 repetitions (punarukti). By tradition some of these manthras can be chanted only in village environments ( graama geya ganaas), some are only in forest ( aaranyageya gaanaas), some are to be chanted at very low voice (ooha gaanaas), some are permitted only in the mind (sound should not be heard outside) known as oohya gaana. In Jaimineeya recensions of Sama Veda, it is said that there are 1232 graamageya gaanaas, 291 aaranyageya gaanaas, 1802 ooha gaanaas and 356 oohya gaanaas. Generally the Sama Veda mantras are chanted during yaagaas.

*Analyses of Atharvaveda: It is said that there are 50 recensions for Atharvaveda. The recensions now available are only 9. pippalaada, thouda, mouda, sounakeeya, jaajala, jalada, brahmavada, devadarsa, and chaarana vaidya. There are nearly 6000 manthras in Atharvaveda of these 1200 manthras are taken from Rigveda. Atharvaveda is more social in spirit than the other three Vedas. This Veda is also known in different names like kshetra Veda, Brahma Veda, Aangeerasa Veda, and soon.*

### *ANALYSES OF BRAAHMANAS*

*Brahmanaas some times come as the part of Vedas ( as in Krishna Yajurveda) and generally they are separate books. They describe the method of yaagaas and customs and rituals for conducting the yaagaas. Generally it is difficult to understand the explanation of the subject without the commentaries. For Rigveda there are two Brahmanaas known as aithareya brahmana having 40 chapters, the second one saankhaayana brahmana having 30 chapters. Both explain the ritual connected with the yaagaas. Yajurveda has Sathapatha Brahmana composed of 100 chapters in one saakha and in the other saakha it has 104 chapters, which give many historical information on ancient India Bruhadhaaranyaka Upanishad is a part of this brahmana. The second brahmana of Yajurveda is thaithireeya brahmana (this becomes almost as a part of Yajur Veda itself, unlike other brahmanaas) in which thaithireeya Upanishad, mahanaaraayaneeya Upanishad, yaajnikee Upanishad are included.*

*Samaveda has the following separate braahmanaas: thaandya – Upanishad – jaimineeya- devathaadyaaya – samhithopanishad- vamsa- arsheya- shadvimsa- cchandokhya brahmanaas are the most important among the samavedeeya brahmanas. Cchandokhya upanishad is a part of cchandokhya brahmana. Atharvaveda has only one brahmana known as gopatha brahmana.*



## ANALYSES OF AARANYAKAAS

Aaranyakaas generally comes at the end of the brahmanaas or as a part of separate book. They are more philosophical or spiritual in subject. In Hindu dharma, there are four stages in life such as brahmacharya, gruhastha, vaanaprastha and sanyaasa. When one reaches the stage of (Vaanaaprastha) leaving the house and go to forest, the rituals are to be performed with utmost simplicity and these rituals are explained in aaranyaka. Rigveda has aithareya aaranyaka as a continuation of the aithareya brahmana. In this aaranyaka comes the aithareya Upanishad, mahaithareya Upanishad, bahvrucha Upanishad and samhithopanishad. In Kousheetakee aaranyaka of Rigveda comes the kousheetake Upanishad. Yajurveda has maithraayaneeya aaranyaka in which maitraayaneeya Upanishad comes. And in thaithireeya aaranyaka comes thaithireeya Upanishads. Sama Veda and atharveda do not have separate aaranyakaas, but the philosophical and spiritual subjects explained in the aranyakaas are coming in some part of the brahmanaas.

## ANAYASES OF UPANISHADS.

Upanishads are the philosophical and spiritual treasury of Hindus. The great messages of Bharath come from the Upanishads. They describe about the pancha praana, pancha bhootha, pancha karmendriya, pancha jnaanendriya and mind. They also describe in detail on specific spiritual aspects and rituals. The Upanishads are classified into five groups. Those belonging to Rigveda are 10 numbers. Upanishad belong to sukla Yajurveda are 18 in number. Those belong to Krishna Yajurveda is 32 and 16 Upanishads for Sama Veda and 32 for Atharvaveda. Each class of Upanishads have separate santhi manthraas. Only one Upanishad comes as a part of Veda, that is the eesaavaasya Upanishad. Few Upanishads as mentioned above come as part of braahmana texts few other come as part of aaranyakaas. Remaining are separate Upanishad texts.

*Rigvedeeya Upanishads : aithareya – kousheetakee- naadabindu- aathmabhoda- niravaana- mulgala-akshamaalika-thripura- soubhagyalakshmi- bahvrucha Upanishads belong to the class of Rigveda with saanthi mantra commencing from vang me manasi prthishtithaa.....*

*Sukla yajurvedeeya Upanishad: eesaavaasya- bruhadaaranyaka- hamsa- paramahamsa- subaala- manthrika- thrisikhibraahmana- niraalamba- mandala braahmana- advaya- thaaraka- bhikshuka- adyaathma- muktika- thaarasara- yajnavalkya- saatyaayana- thureeyaatheetha avadhootha Upanishads belong to the suklayajurvedeeya class with the saanthi manthra commencing with poornamatha poornamidam....*

*Krishna yajurvedeeya Upanishad: Kata- thaithireeya- brahma- kaivalya- swethaaswethara- garbha- mahaanaraayana- amruthabindu- amruthanaada- kaalagnirudra- kshurika- sarvasaara- sukarahasya- thejabindu- dhyaana bindu- brahmavidya- yogathathva- dakshinaamoorthy- skanda- sareerika- yogasikha- ekaakshara- akshi- avadhootha- katarudra- rudrahrudaya- panchabrahma- praanaagnihotra- vaaraaha- yogakundalini- kalisantharana- saraswathee rahasya Upanishad are Krishna yajurvedeeya Upanishads, with the santhi manthra commencing with sahanaa vavathu....*

*Samavedeeya Upanishads: kena – cchandokhya- aarunee- maithraayanee- maithreyee- vajrasoochika- yogachoodaamany- vasudeva- maho(panishad)- sanyaasa-avyakta- kundikaa- saavithree- jaabaala- darsana- rudraakshajaabaala Upanishads with the saanthi manthra ..om aapyaayanthu mamaangaani.... belong to Sama Veda.*

*Atharvavedeeya Upanishads: prasna- mundaka- maandookya- atharvasira- atharvasikha- bruhadjaabaala- seeta- sarabha- mahaanaraayana- raamarahasya- raamathaapinee- saandilya- paramahamsa- annapoorna- soorya- aathma- paasupatha- thrupurathaapinee- devee- parabrahma- bhaavana- bhasma*

*jaabaala- ganapati- mahaavaakya- gopaalathaapinee- sreekrishna- hayagreeva- datthathreya- garuda- narasimhapoorvathaapinee- narasimha uttarathaapinee - naarada parivraajaka Upanishads belong to the Atharvaveda class and they have the saanthi manthra beginning with: Bhadram karnebhi srunuyuama devaa .....*

### **ANALYSES OF VEDAANGAAS:**

*Vedaangas are books connected with Sanskrit language used for writing the Vedas. There are six vedangaas. They are Siksha, niruktha, vyaakarana, chandas saastra, kalpasastra and jyothisha. The words vedaangaas mean the organs of Vedas (parts of Vedas). All the rules defined here for writing the Vedic Sanskrit are also applicable for modern and ancient Sanskrit literature. Thus one can see that rules and science of language are also given through Vedic literature. In each branch of Vedaangaas, it is said that there are 18 books written two/three thousand years ago. Additions, deletions, modifications and corrections are done when new books were written as original ones or as commentaries.*

*Analyses of Siksha : These books give the rules for chanting the vedas. The word siksha means 'learning/teaching' it is the learning of the Vedas. These are known in the names of great sages: Yajnavalkya, Vasishta, Kaatyayana, Naarada, Gouthama, Panini, Sounaka, Sisira, Aapisali - and so on.*

*Analyses of Nirukta : This is second among the Vedangas and this branch of study aims at teaching the formation of Sanskrit words used in Vedas. The roots of the vedic words and the modifications taking place when the words combine. The most authentic book is the Nirukta written by Yaaskaacharya. There are 18 Nirukta books of which important among them are known in the names of Oupamanyava, Gargya, Galava, Vaarshyaayane, Aagraayana, Saakapoorna, Aarnanaabha, Thaitik, Sthouleshti, Kroushtuka, Kaathyayana and so on.*



*Analyses of Vyaakarana:* This is the Vedic grammar book, giving the grammar rules applicable for all the Sanskrit based literature written two to three thousand years ago. The most important among the vyaakarana books is the one written by Panini known as mahabhashya/ ashtaadhyayee having 2105 soothraas/ rules. The other important grammar books are known in the names of great grammarians Aapisali, Gaargya, Gaalava, Saakalya, Saakataayana, Bharadwaaja, Sphotaayana, and so on.

*Analyses of Kalpasaashtra:* There are four major subdivisions for Kalpasaashtra. The Kalpa saashtra books discuss fully the customs and rituals to be performed by each and every Hindu on individual- family- society and as a citizen bases. All the customs to be performed by a married couple in the family comes under the gruhyasootra. All the customs for performing the yaagaas and yajnaas come under the sroutha sootra. The rules and customs to be practiced by the citizens/ officers/kings/ ministers etc come under dharma saashtra. The after death customs/rituals come under pitrumedha sootra. In fact all the Hindu rules/ rituals/ customs are discussed in detail with due corrections/additions/modifications/ and refinement (required in the course of time) , in these books.

*Analyses of Jyothisha:* This is the sixth vedaangaa, in which mathematics, astronomy and prediction part (astrology) are combined. There are hundreds of books written in ancient India on mathematics and astronomy which are the part of vedangaas. A few books are written on the prediction part of the Jyothisha. The first two parts are discussed in detail in the scientific heritage of India published by the Institute.

#### **ANALYSES OF UPAVEDAAS:**

Upavedas are the science books which come as subsidiary- upa- to Vedas . For each Veda there is a subsidiary. They are Arthasaashtra, Dhanurveda, Gaandharva Veda and Ayurveda respectively for all the four Vedas. The Sihaapthya Veda/ vaastu

has also been given the status of the upaveda.

*Analyses of artha saastra:* Artha saastra is economics and the most authentic books in this class of ancient Hindu literature is the Koutileeyam- Chanakya's Arthasastra. This is an authentic arthasastra book with 6000 messages/ rules written in 150 chapters. Each and every line in this book has deep message to convey. There are 18 artha saastra books written in olden days.

*Analyses of dhanurveda:* The books describe on science of archery. All the informations connected with the war and use of weapons are described in the dharmurveda. The most authentic book in this branch of upaveda is said to be written by Dronaacharya namely Dhanurveda. Detailed description of the subject matter is given in the great Indian epic Mahabharatha.

*Analyses of Gaandharvaveda:* detailed decription of music, musical instruments, dance and related arts are given in the Gaandharva Veda text. This Veda is the upaveda of Samaveda. Sarngadhara's sangeetha ratnaakaram is one of the important books coming under this class. Yaamalashatakam, uddheesamahodayam, maansollasum, sangeetha darpanam are some of the important books.

*Analyses of Ayurveda:* This is the upaveda of atharveda describing the health, food and diseases in detail. The Charaka samhita, Susrutha samhitha , Ashtaanga hrudaya, Ashtaanga samgraha etc are the reference books followed today for the ayurveda.

*Analyses of Sihaapathya Veda:* this has been given the status of upaveda of Atharvaveda. here one can read the rules and applications of Vaastu used for houe/temple/ palace/ forts constructions

**ANALYSES OF MAHAPURANAAS:**

There are 18 Mahapuranaas and 18 Upapuranaas. Through these puraanaas ancient Hindu Rishies convey the dharmic

messages as the stories and histories of the kings/ kingdoms/ simple experiences of Rishies and so on. Sometimes the messages through simple stories connected with gods / human beings/ animals also come under the puranic explanations. All the information given in puraanaas are aimed at 'creating a scientific temper and realization of the facts and truths connected with our day today life'

**Names and analyses of 18 Mahapuranaas:** These mahapuranaas are huge volumes of books, many a times each written in 5 to 10 volumes with stories, histories, sub stories, upadesaas/ etc. The names of the puranaas : Vishnu – bhavishya- garuda- agni- mahaabhagavatha- siva- markandeya- linga- brahmavaivarta- malsya- koorma- varaaha- vaamana- skanda- brahmaanda- padma- vaayu- naradeeya puranaas.

**Names and analyses of upapuranaas:** It is said that these upapuranaas are less important when compared to the puraanaas. Their names are samba- devibhagavatha- kaalika- laghunaardeeya- harivamsa- vishnudharmottara- kalki- mulgala- aadi- aathma- brahma- vishnudharma- narasimha- kriyaayoga- soorya- bruhadnaaradeeya- purushothama- bruhad Vishnu puraanaas.

### **ANALYSES OF SMRUTHIES:**

Smruthies are dharma sastra books which give the customs and rules to be followed. The book may explain some specific subject as specialization in some cases and in some other cases , the smruthi books explain rules connected with many subject in an integrated way. Hence there are smurties written in many volumes and some smruthies are very small books. The smruties are updated with due corrections and amendments. The rules described in the smruthies vary depending upon the place and time, hence they are not universal truths and need not be practiced blindly.

**The names of smruties:** Smruthies are known in the name of



following Rishies; Usana, Yajnavalkya, Vishnu, Manu, Aangeerasa, Yama, Athri, Samvartha, bruhad paraasara, Bruhathpati, Daksha, Saathaathapa, Likhitha, Vyaasa, Parasara, Sankha, Gouthama and Vasishtha. Smruthies are also known as dharma sastra books.

#### **ANALYSES OF DARSANAAS (VISIONS):**

There are six darsanaas in Hindu dharma propounded by six great sages. Highly philosophical matters are discussed in these books. In fact every subject under the Sun has been touched upon in these small books. One can understand the darsanaas, generally, only with the help of commentaries:

Jaminee's Poorva meemaamsa is the first darsana which explains the dharma and adharma and their merits/rewards and demerits/punishments.

Vedavyaasa's Uttaramameemamsa: This darsana describes the power/energy/ universal soul known as Brahman which controls everything in the univers externally and internally. This is the basis of advaita darsana.

Kapila's saankhya darsana: Description on the composition of the universe is given as eight type of prakruthi including panchabhootha (five), intellect, mind and awareness/ consciousness on the one side and the universal soul guiding and controlling all these within the system

Patanjali's yogasastra: detailed description of mind and body and the combination of panchabhootha (five) panchapraana, panchakarmendriya and pancha jnaanendriyas (five pranas, five sensory organs and five functional organs) is given in yoga.

Kanaada's vaiseshika: Here the specific description on the atoms by which the universe is composed of has been described. This darsana is specifically different from others in many ways, hence it is vaiseshika (special) darsana.

#### **ANALYSES OF TWO EPICS:**

Ramayana and Mahabharata are the two epics. Generally, Hindus

know about these epics. Hence a detailed description is not required for this branch of literature.

*Analyses of Ramayana:* The first Hindu epic known as aadi kaavya, written in 7 kaandaas (parts) having more than 550 chapters. Through the history, Sri. Rama Avathuara of Mahavishnu, the human qualities are explained here. The Ramyana written in Sanskrit has been translated to almost every Indian languages and important world languages. The messages of life are conveyed to the common people through Ramayana, story telling, dance, kathakali, dance, and so on through out India and Indian continent.

*Analyses of Mahabharatha:* It is the history of Pandavas who were meritorious noble brothers and Kourvaas who were opposite in qualities to pandavaas. The sufferings and pains of Pandavas and finally how Lord Krishna advised to fight for reestablishing the dharma has been explained in the Mahabharatha story. It is said Sage Vyaasa has told, hence everything in Mahabharatha, nothing else remain to be told vyaasocchishtam jagath sarvam

Thus in Hindu dharma the above books and their commentaries give the dharmic messages. None of these books is to be blindly followed or their messages to be blindly practiced. They are only the guiding books, one can walk from one level to a higher level, from there to a still higher and then to the highest level. Till one realizes that he is also the embodiment of the divine power. That is Hindu dharma.

## THE SCIENCE OF HINDU SPIRITUALITY

Hindu/sanaathana dharma has its foundation on scientific spirituality. Ancient Rishies are the authors of the Vedas, puranaas, itihaasaas and smruthies which are known as Hindu religious / spiritual books. Those rishies themselves wrote the books on economics – artha

saastra-, music and dance – gaandharva Veda-, science of health and food - ayurveda-, civil engineering and sculpture – sthaapathya veda, etc which are the well known scientific books. In all the ancient Hindu literature one can see that science and spirituality are integrated. It is mentioned in the 40<sup>th</sup> chapter of the Yajurveda known as Pesavaasya Upanishad that ‘use the scientific knowledge for solving the problems in our life and use the spiritual knowledge for attaining immortality through philosophical outlook. *Avidyayaa mruthyum theerthwaa vidyayaa amruthamasnuthe* . A detailed description on the scientific and technological heritage of Hindu dharma has been separately given and hence it is not included in this text. Here only the science of spirituality is described for giving a clear understanding on the Hindu way of looking into the **different order/level of spiritual science**.

At all levels in other religions there exist only **one god/ divine power**. And that is the one and only one, without even a second on the pathway to attain that one. In Hindu dharma also there exists the ultimate one and only one god. But to attain that one, you can have different pathways and worship of different deities. For reaching New Delhi, the capital of India, there can be many pathways/ roads, but New Delhi remains the (same) one location. Some of these roads may be short cuts, some may be smooth and some other may not have street lights, etc. Thus the roads and nature of roads vary but the ultimate goal remains the same.

**The one Hindu god and its scientific explanation** : There exists only one god and it is reiterated throughout the Upanishads and Vedas. *Ekam sath vipraa: bahudaa vadanthi*. The ultimate truth is one and only one, but some scholars may tell that it is many fold. *ekam eva na dvitheeyam*. The only one without the second. Further you can see the words of Rigveda: *dyaavaa pruthvi janayan deva* etc: the god, who created the celestial bodies and this earth, is one and only one. *Eka eva hi bhoothaatmaa bhoothe bhoothe vyavasthithaa ekathaa bhahudaa chaiva drusyathe jala*



*chandravath*. The ultimate divine power is one and only one which is existing in each and every living being. It may be said by some as one and some others may say it as many, but the truth is like this; there is only one moon and it is reflected in different waters ( of river, well, a cup of water, sea or ocean). Just like the reflection of the one moon is seen in all, the same divine power is manifested in all living being. Even the whole philosophy of the advaita is based on the non duality of the divine power ( a-dvaita – the one without a second)

The name of 'that one' in Hindu dharma is **Brahman** or **Brahmam**. Hindus do have different levels of *upaasana*/ worship. But the ultimate point where all the pathways arrive at is this point of Brahman ( do not pronounce Braahman). The Vedas say *Brahma sathyam jagath mithya*. The ultimate essence of everything is this Brahman and everything in the universe is the manifestation of that ultimate truth (which is the Brahmam). *Jeevo Brahmaiva na aparaa*: Even the life force / soul itself is the same Brahaman and nothing else. The Brahmam is present in everything, in the smaller than the smallest ( in atoms) and bigger than the biggest (in the universe) and also present as the *jeevaathma* in all living beings: *Anoraneeyaan mahato maheeyaan aatma guhaayaam nihithosya jantho*: says Mahanaraayana Upanishad. One can see pure science in this explanation: The revolution of electrons and the spinning of the nuclei in atoms, the rotation and revolution of earth, the solar system, the galaxy , and so on are all guided from within the system and this force which gives the energy and guidance for their movement is known as Brahman. It is this same energy manifested as *jeevaathma* in the living being which controls the heart, lungs, the liver, the blood circulation, the sensory organs, the functional organs, etc. in animals. In the *mahaasankalapa* , it is thus explained *achinthyayaa aparimithayaa sakthyaa briyamaanasya aneka koti brahmandaanaam madhye* ; the billions and billions of galaxies which are revolving/ rotating under the torrential force which is beyond the level of imagination and limitless ... this force is from within the

system and it is the one which guides the rotation and revolution. Hence the ancient Indian Rishies said that Brahman is the ultimate force/energy. Upanishad says that the Brahman is the one which can not be seen through eyes, heard by ears, analyzed by mind but the energy which is responsible for the proper functioning of the eyes, ears and mind.... Is Brahman. *yath chakshushaa na pasyathi yena chakshoomshi pasyathi....., yath srothrena na sruthi yena srothra mitham srutham....., yath manasaa na manuthe yenaahur manomatham..... thadeva Brahmam viddhi yadidam na idam upaasathe.* is the Brahman and worship that Brahman. In other Upanishads it is explained that the fire and air (*prathyaksham Brahma*), the sound (*sabda Brahman*), the Sun, the light (*chaakshu Brahman*), and so on are all the manifestation of this Brahman. This gives a clear definition for Brahman **that it is the energy and manifestation of a power**

Brahman is also present as *jeevathma*/ soul in me hence I say *aham Brahma asmi* ( I am the divine power) It is present in you hence *thath thwam asi* ( you are also the same divine power) It is present as life force hence *ayam athma Brahma* (this life force/ energy is the Brahman) and it is manifested as the **inherent intrinsic consciousness and awareness**, hence *prajnaanam Brahma* (that glorious knowledge is Brahman). These four sets of words corresponds to *Yajurveda, Saama veda, Atharvaveda and Rigveda* respectively, are known as four *Mahaavaakyas*. The yogi who could get the experience of the realization of the *Brahman* is known as *Brahma jnaani* and the process of realization is known as *Brahma saakshaathkaaram*. That state of *Brahma jnaani* is also known as *kaivalya state*, the state in which one knows that only **one** is existing (*kevalam* means only one). *Aksharam Brahma paramam* means the Brahman is non destructible for ever. *Brahmakshra samudhbhavam* Brahman arose from the non destructible. There are few vedic and *puranic* words connected with Brahman, they are *Brahmaandam* ( the universal egg – a state before the big bang) Lord Brahma ( the creator of this universe and everything present

here from energy) *Brahma vaivartham* ( the manipulation and manifestation of the universal force/ energy).... Now the word *Brahman* may be clearly defined based on the above explanations using modern science as follows: **the intrinsic, inherent, self guiding, self motivating, self awareness and self conscious present from each and every atom to the universe itself, is the Brahman, the ultimate god of Hindu!**

It is said that there are two states of *Brahman*. The extremely active state in observation known as *saguna Brahman* and the inactive state in observation known as *nirguna Brahman*. These two states are complimentary and never contradictory (as few scholars may say). (*saguna and nirguna* may be opposite words just like lower and upper are opposite words. But lower primary and upper primary are not opposites, they are complimentary). In an atom, the electrons are revolving at a fantastic speed/ velocity (*sagunathwam*) but the materials which are composed by the atoms are seen in *nirguna* state ( without rotating and spinning). The earth rotates and revolves at high speed (*saguna* state) but the people living on the globe earth do not feel the speed (*nirguna* state in observation). Our heart/liver/ lungs/ each and every tissue functions/ works for all the 24 hrs ( in *saguna* state), but the body does not feel that (particularly when sleeping) such a series of biochemical processes are going on inside (*nirguna* state). Thus there are observationally two states for the Brahman one *saguna* state and other *nirguna* state. Sometimes *saguna upaasana/* worship also means the worship in forms and images and *nirguna upaasana/* worship means worship without keeping the images.

From the upanishadic explanation that the universe is filled with the *Brahma chaithanyam* ( the intrinsic... awareness and consciousness) it may be difficult for for a common man to understand this concept. For the understanding at a lower level and for giving a better perception for common man, the Brahman has been symbolically presented as a personified form of *prapancha purusha or viswa*



*roopa* ( *prapancha* – univers; *purusha* – human form *viswa* – univers, *roopa* – size and shape) . This is a concept and symbolically presented, hence it is well defined as *prapancha purusha sankalpa* ( *sankalpa* – concept). It is narrated as *viswaakaram gagana sadrusam megha varnam...* having the size and shape of the universe, similar in area to the sky itself and colour that of clouds.... It is described in Vedas as *viswathaschakshurutha vishwatho mukho viswatho bahurutha viswathaspaath...* its face, brain, hands and legs have spread over the universe and everything in the universe works under his guidance and control. Bhagavath geetha gives the power of *viswa roopam* like *divi soorya sahasrasya bhaveth yuga pathutthithaa...* it looks as though thousands of Suns are blazing. The size of the *prapancha purusha* has been explained *na antham na madhyam na punasthavaadim* : there are no beginning, middle and end for that *viswa roopa*. Lord Krishna himself tells in Bhagavath geetha for seeing the universal person/ *viswa roopa*, one needs the divine eyes ( *divya chakshu*). Vedas describe it through *purusha sooktha*.

This *viswa roopa / prapancha purusha* is known in *puranas* and other literature (some times in Vedas too) as *Mahavishnu / Vishnu and Naraayana*. *Puranas* give detailed narration for *Naraayana*

At further lower level there exists a trinity concept in Hindu dharma. The trinity concept of Hindus is different from that of other religions. Here the 'controllers' of birth, existence / growth and death are symbolically presented in human forms as *Brahma Vishnu Maheswara – trimoorthy sankalpa* in which the universal laws of life cycle are symbolically presented . Mahavishnu is the base for the trinity concept.

**Explanation for Mahavishnu:** The blue colour of Vishnu denotes the colour of the sky and ocean which means the infinity/ limitless. The serpent on which Vishnu is lying denotes the coiled structure of galaxy. The name of the serpent *anantha* means limitless (infinity) the *ksheera saagaram* (

*ocean of milk) on which Vishnu is pictured shows milky way galaxy. Anantha sayana represent the silent universe/galaxies. Symbolically Mahalakshmi (meaning of this word is prosperity) has been attributed the position of the wife of Mahavishnu showing that any system can smoothly exist only with prosperity.*

From Mahavishnu comes out through a Lotus (symbolically) the creator Lord Brahma. This symbolically presents a connection of Lord Brahma with the *prapancha purhsa* similar to the connection of the baby in the womb of the mother. The baby takes the energy and nutrition for growing/ cell production from the mother. Similarly Lord Brahma takes energy and material from for creation in the world. The four heads of Lord Brahma represent the four axes required for any creation: x, y, z and time axes. The Vedas (the word itself means knowledge) in the hands of Lord Brahma and the position of Saraswathy (deity of knowledge) as the wife of the creator symbolically present that for every creation knowledge/ vidya is required. The knowledge and creation (knowledge for creation) are inseparable components.

Lord Siva is the deity symbolically presents the controller of death/ destruction (the destruction is for further construction). Mahavishnu and Lord Siva are said to be connected through hearts ( which only means inseparable) *Vishnoasya hrudayam siva: Sivosya hrudayam vishno* – says Upanishads and Yajurveda. Symbolically Lord Siva has powerful fire in the third eye, powerful water and torrential air symbolically tied in the tuft and the snake around the neck ( symbol of international medical association) and thri sool in hand. All the five respectively present destruction through fire, water (flood , etc) air ( cyclone/ tempest, etc) diseases and using weapons. Parvathy (means energy/force/sakti) is symbolically presented as the wife of Lord Siva . Through this combination of Lord Siva and Parvathy, it is shown that the destruction for construction can take place with powerful application of any one or more of the above five. (powerful fire, air,

water, diseases and weapon only have the destruction capacity). Thus they become inseparable hence the concept of *Ardhanaareeswara* comes up. In fact the *Brahma Vishnu Maheswara sankalpa* and the *Lakshmi Parvathy Sarswathi sankalpa* are the symbolic presentation of the life cycle at spiritual- social and physical level when scientifically explained. Always the Hindus consider the knowledge, prosperity and sakthi/power in feminine gender. These explanations (of the gods) are the connecting layers of Vedic and puranic concepts of gods.

*Further going at common mans level, the above six deities can be seen in different roles of puranic stories to convey the message of what they represent symbolically in. However these stories are mainly for conveying the values and universal truths in our life. And they are meant for the understanding for less educated common man who may not be in a position to understand the Brahman or prapancha purusha concept, or the symbolic message of Hindu trinity concept, etc.*

**About other deities:** In puranas one can read the stories of *Vigneswara* having the shape of the cross section of human brain, worshipped as the Lord who removes/ protects from the hurdles in the life. Hurdles can be as huge as elephants and it can come from anywhere just like a rat (*mooshika vaahana*) comes. Students who learn the six branches of Vedic subjects *Siksha- nirukta- vyaakarana- chandassastra- kalpasastra and Jyothisha*, worship *Subrahmanya/ Muruka*, *Subrahmanya* is given the Lordship of six subjects. Hence six heads one for each subject. Incidentally, I feel it is worth explaining here that *Ravana* is said to have ten heads. It is because *Ravana* has the capacity of ten heads ( he has learned the four Vedas and six *Vedangas* and even he had tried to master the 11<sup>th</sup> subject , the *Ayurveda* too). *Yamadharma raja or Kaala* is the controller of death *Yaama* and *Kaala* (*yaamasya apathyam pumaan yama:* and *kaalasya apathyam puman kaala*) both means the controller of time. Hence the names clearly give the scientific truth



that the death is connected with the time. *Kaala* is symbolically presented coming on a he buffalo ( he buffalo is said to be the most senseless animal, hence the time of death arrives to us senselessly – and takes our breath- without looking the age, religion, sex or any other parameters of the individual– we say people die just like that)

Lord Krishna and Lord Rama and many heroes of the puranas and epics give us the message for elevating ourselves from the ordinary human level to the level of incarnation/ *avathara* level. Their message enrich our life. They stand as role models in our life. Hence they are worshipped and celebrated as *avatharas*. In Hindu dharma none is a sinner. Hence everyone has the opportunity to elevate/ rise himself to the level of god. We say *krinvantho viswamaaryam*; (God will not get jealous of you if you are getting the level of god himself, in Hinduism). Let us convert the world into a great men's abode. Human being is considered as the children of immortal *..amruthasya putraa*: Every deity in Hindu dharma has a connected animal, bird, tree, flower, celestial body or planet (as *adhidevatha* or *pathyadhidevatha*), colour, metal, medicine, *manthra*, *gayathri*, letter, *dhyaana manthra*, *moola manthra*, ...etc. This gives an excellent message that these are to be protected. In Hindu dharma there are 33 crore (koti) *devaas* ! The meaning of this statement is very simple but wrongly understood . Koti means part ( not ten million) and here 33 parts *devaas* (people with divine qualities) 33 parts *asuraas* ( people with demonic qualities) and 33 parts *maanavas* ( people with ordinary human qualities)- it is just like we say 1/3 of the human beings have divine, demonic and ordinary human qualities each. It is said that Hindus worship everything ! True in everything we can see the divine power and that divinity could be felt when we elevate ourselves into that level . Even a stone / wood / photo/ image becomes an idol *archakasya prabhavena sila bhavathi sankara* ( by the proper method of worship by a priest/ devotee even a stone can be converted into Lord Siva /*Sankara/ vigraha/* idol. *Archakasya aprabhavena siva bhavati sila*, by the improper outlook/ method of worship even the god itself will become a stone.

Hindus worship in temples. The temples are not merely prayer halls for Hindus, they are the quantum healing centers (*kshayaath thraaythe iti kshetra*). In temples the light, heat, sound and chemical energies are filled through lighting the lamp, camphor, keeping mirrors, etc. The sound energy through *manthra*, ringing of the bells, musical instruments, bhajans etc. The chemical energy is from bathies, aromatic flowers and leaves etc. Thus the temples are energization centres in Hindu way of worship. A devotee has to stand for few minutes in the temple environment in front of the *vigraha*/ idol with *sareera* ( body) ,*mana* ( mind), *aahaara* (food), *vaak* (words/ talking ) and *karma* ( deeds) *suddhee* (purity) for energisation.

Hindus never allow the cremation or burial of human body in the temple premises Hindus always keep the idols or images having smiling faces (*Prasanna vadanam dhyayeth*- meditate on the god having smiling face). Hindus never place the sad/ crying faces or bleeding bodies for worship. The offerings of the gods, from the temple are taken as shared *prasadam*s not as body or blood of the gods. Hindus never pray for unloading/ transferring their sins to the god or representatives of god or saints. Using the concept, that the sins are transferable to someone who is a representative of god and punishing him for our sins is not existing in Hindu dharma. But Hindus pray for guiding through correct and dharmic pathway so that one can prevent committing the sins (*ithamaso maa jyothirgmaya, ....etc*) Hindus never pray to god through intermediate saints, they submit directly their prayer. The people who fought for spreading the religion using swords and bloodshed and denigrated other religions are never elevated to the level of saints. The offering given to temples are not the bribes to gods but for *pancha yajna*- the offering for gods *Deva yajna*, *Rishi yajna* – for sages, *Pithru yajna* - for forefathers, *bhootha yajna* - for all other living beings and *Manushya yajna* for feeding the poor people. The idol and temple are compared with human body (*idam sareeram kountheya kshetramithyabhid heeyate*) and human dwellings. Hence whatever are required for human body are performed through *thaanthric* way to the idols also. In olden days the temples were the capitals of the villages,

through them the food supply, education, help for the society, legal consolation, counseling, marriages, etc were given/performed. The priest hood of Hindu dharma and that of other religion are entirely different. The role of the priests was not political at all but to advise on dharmic and spiritual way. Hindus are never god fearing, they have only devotion to god not fear ( *daiva bhakti* and not *daiva bhaya*). There are five bhavas for the bhakti – saantha bhaava, daasya bhaava, sakhya bhaava, vaalsalya bhaava and maadhurya bhava. In all these the question of fear does not arise

Additional points to remember: Hindus worship the fire, air, the Sun, the celestial bodies, etc because they are all the parts of the *prapancha purusha*. The same reasoning is given for the worship of mountains, earth, rivers, etc. Hindus worship animals and plants and in fact every deity has a plant and animal associated with them, because all of them have *jeevaathma* / life force in it. Hence they are considered as divine in nature (*jeevaathma* is a part of *paramaathma*). The Vedic way of worship is through havans /offering through the fire. The puranic way of worship is the temples and idols and images. Every temple has a specific *vaastu* connected with it and that *vaastu* resembles the *yaaga saala*/ house of *yaagaas* and fire altars. Hindus say Vedas are holy because it gives absolutely (no stories ) the universal laws and truths. Anyone can learn Vedas and there did not exist a rule that people belonging to only one caste can learn Vedas. For keeping the seriousness and for strictly following the rules, the scholars defined that who has Brahminical qualities only can learn Vedas, which can be acquired and not obtained by birth alone. All the Rishies who composed Vedic *manthras* were not Brahmins, Sri Krishna or Sri Rama were not Brahmins. Many ancient *Rishies* and many of those *Rishies* who are living even now are not Brahmins.

Hindus worship books/letters/ because it is the base for knowledge. Hindus worship the tools and instruments during *aayudha pooja*, by performing pooja once in an year because tools are the lively



hood for human beings. Hindus have given the status of divine power to many phenomena like: the Sun, because it gives light and heat for all living beings; the air, because all living beings are surviving because of it; the water, because without which life is impossible; the earth, because it is where all the life is surviving (not only that they are all parts of *prapancha purusha*); our parents, because they gave birth for us and they are our creators; plants and trees, because they provide us food, and so on.

The Hindu way of life is different from that of the followers of other religions. Learning and practicing Hindu dharma should be done directly and it is an experience. All the Hindu way of life is through customs and rituals. It is always advised to follow the relevant and scientific customs and rituals which are beneficial psychologically, physiologically, family based relation and social relations strengthening and also for national integration. All this customs and rituals put together is known as *sanaathana dharma* hence it is said Hinduism is not a religion but a way of life. Hindu dharma get refined continuously by the Rishies, hence any superstition comes into the Hindu dharma, Rishies like Lord Budha, Jain, Sankara, Madhwa, ..... They refine and make it more powerful.....

Thus says Lord Krishna in Bhagavath Geetha: Whenever the dharma comes down and adharma takes an upper hand, the god himself will do the needful for the uplift of Hindu dharma. He will protect the nobles, punish the bad people and protect the dharma. Perhaps that is the reason why even after more than one thousand years of foreign invasion, massacre, destruction, plundering and looting by the foreigners, this dharma did not perish. It is fast spreading through out the world particularly in the developed world. Let us all learn the basic principles and application of those from the Hindu dharma scientifically either for practicing it or for challenging it.

## SCIENTIFIC AND TECHNOLOGICAL HERITAGE OF HINDUS

This is only an outline on the scientific and technological heritage of Hindus to be selected for the study by the individuals depending on their own interest and specialization. They may collect as many points asking the questions why ? how ? when ? where ? what? and comparing the answer with the knowledge existing in other parts of the world, in each topic, so that they can learn thoroughly and teach others. Let us try to become an expert in selected and specialized areas of Indian scientific heritage. The syllabi are given as subject wise.

Example : If in the syllabus Ajantha is given, ask the questions what are the novel points with Ajantha cave temple? when was it constructed ? how it was constructed ? what are the salient structural features of Ajantha? How the people in other parts of the world were living, during when this Ajanta cave temples were constructed (BC 50) ? What was their capability in this subject area of cave structure construction ?.....Ask these questions and find out the answers. Repeat the same for other syllabus points.

### BIOLOGICAL SCIENCES

**Health science (Health science is a part of ayurveda which is an upaveda of Atharva veda. It is also discussed in yoga sastra which is one among the six darsanas of the Hindus. The subject has also been dealt with in puranas and itihasas):** The Indian vision on health as given by Maharshi Susrutha, Charaka and Vagbhatachaarya and many others. The approach taken by Patanjali in Yoga sastra, the spiritual approach of body and mind, etc will be the part of the Indian health science. Aswini devatha concept of hitha aayaasa and mitha aahaara (food & exercise), need of appropriate exercise based of the age-sex-physiological conditions, etc. Yogaasanas, sooryanamaskaara, effect of medicines, identification of diseases through saastram pramaanam/ aaptavaakyam

pramaanam/prthyksham pramaanam/ anumaanam pramanam / methods. Use of drugs, fastings and pathyas and fasting as a part of customs/rituals. Selection of food based on climatic variation/age/ health conditions/etc of the person/patient, physical and mental rest, upaasana and worship as a part of day to day life, ethics and morality in the common man's life and also for doctors, ... causes of illness, pathogenic organisms, precautions to be taken for good health, solar therapy, music therapy, Yoga therapy, Reiki, energy healing, water therapy, as described in the Indian system. The knowledge on surgery and plastic surgery and surgical equipments known sastras and yantras as described in Susrutha samhitha, practicing surgery as given by Maharshi Susrutha. Variety of acharas/customs and rituals influencing the health. Importance of vegetarian foods. Indian traditional foods and their merits. Taking oil bath during selected days, hot/cold water bath. Allowing children to play in the soils after smearing the oil. 'Grandmaa's technological foods' for babies and baby health care system existed in ancient India.

**Mental Health / Psychology (this again is a subject of ayurveda and yoga/ poorva meemamsa/uttarameemamsa/vaiseshika/ darsanas and Upanishads. It has been discussed in detail in Yogavasishta, Bhagavath geetha, dharma saastra and so on):** Description of mind given in Upanishads, mental influence on health, the influence of yamaas and niyamaas: ahimsa- satyam- astheyam- brahmacharya- aparigraham- oucham- snthosha- thapa- swadhyayam- eeswara pranidhaanam –etc. Effect of stabilised vision on life, controlling the angr, fear, and attachment, mental preparations to face ups and downs/loss and profit/ success and failures/ animosity and friendship/ appreciations and criticisms ...as described in Indian philosophical books. Influence of puranic / epic related stories in mind to face the realities of the life. Influence of pranayam/ dhyaana/ dharana etc on the mental development. Impact of food on mind as proved by the modern science, effect of saatwic food, dreams, effect of manthras on mind, customs influencing the mental health and family relations. Analyses of the purpose of living, family-social-and



national goals to be put forth for a purposeful life and its impact on mind. Spirituality and faith in healing. Effect of curative chemical on mind and body. Bhajans /keerthans/ prayer/ manthras etc on mind. The positive songs and images influencing the mind. Psychologically influencing acharas.

**Food science**(very specific explanations are given in ayurveda- as told –it is a part of atharvaveda. It has been given in dharma saastra and gruhyasootra part of kalpasastra and to some extent in puraanaas): Variety of Indian foods, balanced nutritious foods, natural traditional baby foods, the medicinal components usually added in Indian foods (like asafoetida, turmeric, spices, mustard, etc), pathya based food during illness, specialized cooking, roasting, fermenting, processing, preserving, etc. done for variety of foods and their science. Generation of specific flavors in foods by suitably modifying spices. The science of altering the foods during fasting on specific days like ekaadasi/ somavaar vratha/ karthika month/ vaisaakha month/ etc. Opting for integrated balanced foods through fasting and vrathaas, importance of selecting cooking vessels like ceramics / iron/copper/ brass vessels ( for getting micro nutrients like, iron, zinc, copper, silica, magnesium, sodium, potassium etc), variety of vegetables and their significance in balanced healthy foods. Many more significant scientific observations can be made if a student carefully examines the Indian foods, naturopathy, and vegetarian food.

**Chemistry ( Rasachikitsa is a part of atharvaveda based ayurveda prevalent in north India. All the authors of Rasachikitsa were Siddhas or Maharshies. The chemistry descriptions, one can see systematically in the rasa books) :** The ancient Indian chemistry books like rasarnava, rasaratna samucchaya, rasendra choodamany, rasarnavakalpa, rasa chandrika, rasaratnakara, and hundreds of rasa based books . (These books are available in Sanskrit with English or Hindi translations.). The knowledge on chemicals, particularly in inorganic chemicals, like sulphides/ sulphates/oxides/ etc. Sanskrit names of chemicals, detailed

description given for setting up a laboratory, scientific temper, qualification of laboratory assistants, research scholars as described in Rasaratna samucchaya. properties of inorganic chemicals and their use described by Vagbhatacharya, centuries ago. Chemicals used for various purposes as described in Bharadvaja in yantra sarvaswa, Varahamihira in Bruhath samhita and also by others in the above chemistry books.

**Bio-pesticides( biopesticides are part of vrukshayurveda which again is a part of Ayurveda or Bhruhat samhitha):** Variety of plant products, Neem, sweet neem, neem cake, mustard cake, tulasi, clove, pepper, turmeric, tobacco, oils from sesame, cotton seed, castor etc., used as bio pesticides and as preservatives, traditional methods of pest control like fumigation with neem/ sulphur/ camphor/ coconut husk(since it contains sulphur /coconut shell (raw- for its phenolic content) / cow dung (since it contains ammonia). The use of panchagavya / aqueous cow dung filtrate /extract as pesticide. The traditional knowledge available from farmers. Detailed descriptions for controlling the pests/microorganisms/etc given in Vruksha ayurvedic books.

**Plant drugs/pharmacology ( this is a part of the atharvavedic ayurveda):** Active plant bio-chemicals possessing medicinal plants, as described in Charaka samhita, Ashtanga hrudaya, ashtanga sangraha, sahasrayoga, etc. comparative studies on modern and traditional knowledge of medicinal plants. The student can try to understand as many plants as possible which are good sources of the bio-active principles. Variety of plants ( herbs, shrubs, creepers, grass, trees etc.) used for curing diseases. The plant leaves, buds, flowers, stems, roots, latex, etc used for treating specific diseases. Single drug treatment.

**Medicines and medicinal preparations /plant biochemistry (Charaka samhitha and Susrutha samhitha are written by Rishies of the caliber of those of vedic Rishies, this also include sages like Chyavana/Brugu/Vagbhata/Agastya and so**

on): The descriptions of inorganic chemicals used as medicines in ancient Indian Rasa chikitsa books, their preparations/processing and preservation. The plant products used as drugs, the raw drugs, their harvesting, drying, storage, mixing, drug formulation, decoction preparation, etc. Variety of Ayurvedic drug formulation obtained by mixing many raw drugs. Knowledge on the possible chemical changes taking place in ayurvedic drug preparation while drying, storing, heating, roasting, boiling with water, concentration, etc (all ayurvedic preparations). Here we have to focus only on the knowledge existed and their scientific merits, in the area of plant drugs. The scientific knowledge behind kashaya/decoction preparation, choorna, kwatha, lehya, arishta, ghrutha, thyla. etc reparations and their basic principles of applications.

**Basic plant sciences/botany:** Detailed description given in Vrukshayurveda by Rishies like Saarngadhara, Katyayana, Varahamihira, Parasara, and others. Plant growth, grafting, irrigation, use of manure, seeds preservation, phototropism, agricultural practices both basic and applied. Seasons of sowing/planting/ biodynamics of agricultural practice, etc., Variety of the traditional knowledge still practiced in villages, in the production of agriculture commodities.

**Fermentation technology.** The knowledge of microorganisms existed in India as described in ayurvedic books. Fermentation of milk to curd and yoghurt, fruit juice fermentation to wines, medicinal preparation of arishtas, etc. Fermentation procedures followed in four major types liquors mentioned in Chanakya's Artha saastra ( Arthasastra is an upaveda of Rigveda), the source of microorganisms, cultures, fermentation products mentioned in the ayurvedic and vrukshayurvedic books. Fermented rice based common solid foods like pan cake, fermentation of traditional liquors from coconut and palm products are the examples.

## TECHNOLOGICAL SCIENCES

**Ancient Indian mines:** Knowledge on the ancient Indian mines which were active during the last three or more millenia, the ores/



minerals of copper, gold, zinc, lead, silver, distributed through out Rajasthan, Haryana, Bihar, Bengal, Gujarat , Karnataka, Uttar Pradesh, Madhya Pradesh, etc.... The technology adopted for digging, mining, transportation, processing and refining the above ore prior to metallurgical processing, provisions given for aeration and lighting in mines, etc. the present day scenes of ancient metallurgical sites.

**Ancient Indian knowledge in Metallurgy** (metallurgy is a part of lohathantra which again is becoming a part of Rasachikitsa/saastra): The production and purification of metals, the use of flux and slag, temperature attained, technology for the production and purification of metals like tin, copper, iron, silver, gold, zinc, lead. An understanding of the chemical reactions accomplished like, oxidation, reduction, slag formation, distillation of low boiling metals, etc. The fine technology used for the large scale production of bronze, brass, panchaloha, bell metal, coin making metals and many alloys mentioned in chemistry books and also in the books like Chanakya's Arthasastra. Impressive metallic alloy preparation techniques mentioned in the Rasa books , rasopanishad and Bharadvaajaa's writings. The kilns and mooshas used for the metallurgical applications. Special methods adopted for the preparation of zinc and lead. Preparation of the purest form of copper and alpha and beta brass. Identification of alpha and beta tin and descriptions of the physical characteristics of these metals. The metal ingots, sheets, plates etc of zinc/lead/iron/brass/bronze/copper/gold/silver/...of ancient Indian origin excavated from other countries like Athens, Babylonia, Rome, Egypt,.

**Ancient Indian Iron making technology.** Production of pig iron, cast iron and wrought iron, Delhi and Dhar iron pillar, forge welding, lamination, paint coating for preventing the rusting,. Making the swords, the Banaras and Kodumanal swords, carburization in iron instruments used in agriculture and surgery. Rust free preservation techniques adopted for iron, woortz steel. Large scale production of iron alloys. export of iron to European/ middle east countries. The iron technology existed in North Kerala/Andra/Nasic/ Gujarat/Bengal/Varanasi/etc.

the Damascus sword from India.

**Ceramics science and technology in ancient India (detailed description of the moosha is given in Rasa based books) :** The top quality ceramics vessels, tiles, glazed vessels, beads, bricks etc. produced in Harappa, Mohanjo daro, Lothal, Varanasi, Thakshasila, Kalibhangan, Hastinapura, and many other North and south Indian archeological sites. Variety of coloring materials used for the ceramics vessels and decoration ceramics articles which were also used in the glass making. The great bath of Mohenjo daro, the lost city of Cambay, Dwaraka, Hastinapura, etc

**Industrial and instrumental glass technology existed in India:** Variety of multi colored glasses with different size, shape, appearance and capacity produced in India. The glass beads, ornaments, plates, vessels, made using variety of inorganic coloring materials like the oxides, carbonates, sulfates, phosphates, etc of chromium, lead, copper, iron, nickel, calcium, sodium. The non metallic compounds used as coloring materials. Technology introducing the golden/ silver leaf/plates in glasses.

**General Instruments used in ancient India:** Description of a variety of instruments given in Bharadvaja's yantra sarvaswa (Bharadvaja is now a clan ordered after the great Vedic sage of Bharadvaja. He is known as Maharshi Bharadvaja. Only a part of his book Yantra sarvaswa/ amsubhodini is now available) the Vaimanika saastra, dvaantha pramapaka yantra, etc. The numbering systems with serial numbers of the components of instruments, alloy preparations, quality of glass lenses, prisms, glass plates, variety of Krithaka loha, (artificial metallic alloys having non metallic compounds also) dies used for molding the instrument parts/components, in required size and shape. The instruments used in astronomical calculations known under the title jyothir yantra.

**Musical instruments ( Music is Gandharva veda which is an upaveda of Saamaveda. Music/ dance/ drama/ musical instrument are all originated from Saamagaana) :** Variety of

string instruments for music/dance performances, the metallic alloys used for the preparation of strings, wind instruments, the knowledge of sound waves, the membrane instruments, preparation/processing of the membranes for these musical instruments. The basic knowledge of sound in music. The granite music pillars known as sangeetha mandapa seen in ancient south Indian temples. Traditional Indian musical instruments like flute, idakka, mridanga, chenda, thaala, naadaswara, veena, violin, harmonium, and so on. The basic principles adopted in their making and use.

**Surgical instruments (detailed description of these instruments and their pictures are given in the books written by Maharshi Susruta as a part of Salya chikitsa which again is a part of ayurveda/ upaveda of atharva veda):** The surgical instruments known as sastras and yantras numbering more than a hundred, as mentioned in Susruta samhitha, the metals used for making these instruments. Their size, shape and comparison with the modern instruments used for the purpose. Description of plastic surgery techniques. The instruments for kidney stone removal, stitching, cutting open, etc. all these instruments used in the modern surgery tables may be compared with those available thousands of years ago, in India.

**Laboratory equipments (this description is coming as part of rasa books):** More than 35 types of ceramics, glass and metallic equipments mentioned in Rasaratna samucchaya for the use in chemical laboratories for the processes like, distillation, sublimation, extraction, drying, heating, roasting, mixing, decanting, etc. generally known under the name yantras made using specific quality clays. Many varieties of mooshaas, put yantras were also used here for processing the metals and other compounds.

**Kilns/furnaces, mushas & Putas** used for metallurgy. Variety of furnaces and kilns, crucibles used for the production of various metals and alloys. The temperature attained for oxidation, reduction, slag preparation and distillation of variety of metals and



correspondingly suitable selection of putas/furnaces. Heating materials and their proportions, heating time, flux used for removing the impurities in the metal processing . description of maha gajaputa, gajaputa, kukkuta puta, kapotha puta .....etc and their preparations.

**Painting Technology/organic and inorganic colorants ( this subject coming as part of sthaapathya veda /architecture which is an upaveda of Rigveda sometimes it is also said as the upaveda of atharva veda) .** The chemistry of the paints used in Ajantha, Ellora, and other cave temple paintings, mural paintings, the inorganic colors and plant products used for paintings, their preparation, mixing, applying on the preprocessed surfaces. Selecting and processing plant products used as paints. The preparation of inks, for variety of applications. Mural paintings, oil paintings, preparation of painting beds/ walls/ canvass, etc as done in cave temples and walls.

**Textiles technology ( detailed dscription can be seen in dharma saastra and also artha saastra part of either kalpasaastra or upaveda):** Ancient Indian textile industry as mentioned in Chanakya's Artha saastra, textiles produced using cotton, silk, wool, jute, and also incorporation of gold, silver and lead metallic threads as borders for the textiles. The famous Kancheepuram, Banaras,.. sarees/textiles. the dying technology and coloring materials used. The textile dyes, leather colors, variety of coloring materials produced in different parts of India and method of application of the dyes.

**Civil engineering and architecture ( The subject matter is dealt with systematically in Sthapathya veda which is upaveda – as mentioned above. Detailed dscription is also available in artha sasstra books) :** The civil engineering skill demonstrated in the famous south Indian temples constructed by the kings of the Chola, Chera, Pandya, Hoysaalsa, Kakateeya, Vijaya nagara ...periods. The huge and tall entrances/gopurams of these temples. The mortars/ cements used for the construction of these temples. The instruments used for measuring / maintaining the geometry of these structures. The

granite/ marble/ laterite stone cutting and polishing equipment/devises existed during then. The transportation techniques adopted for the huge granite pieces. Construction of marble temples, palaces and lake palaces in Rajasthan . The temples of Kancheepuram, Rameswaram, Chidambaram, Kumbhakonam, Thiruvannamali, Sucheendram, Trivandrum, Konark and Khajuraho,.... The music pillars and music mandapas, the knowledge on the sound waves produced by these granite pillars and granite stone carvings (thick-thin - pointed and so on) The carving undertaken with top precision, in all the above structures.

The construction of cave temples, of Ajanta, Ellora, Elephanta, knowledge on geological aspects of rocks in which the Chaityaas and Viharas were carved out. Huge palaces constructed particularly like Jaisalamar palace, palaces in the pink city Rajasthan, Gwalior, Mysore, Hyderabad, etc the air conditioning/temperature maintaining mechanisms adopted, glazed and non glazed tiles/glasses used for flooring/windows. The ponds and water reservoirs made thousands of years ago. (learn as many structures constructed as possible and their technologies)

The civil engineering sciences and technologies of forts and walls, channels, rivers etc. the archeologically important sites of Mohanjo daro, Lothal, Harappa, Dwaraka, the lost city of Cambay etc

### **BASIC SCIENCES:**

**Basic principles of physics (for these basic principles one has to search very many books; examples are sited against each subject) the velocity of light ( Sayana Bhashya for Vedas), wave nature of sound (Maharshi Gouthama's nyaaya saastra), seven colors of light (Rigveda), Heisenberg's uncertainty principles Patanjali's yoga sastra), definition and explanation of atoms, gravitational forces (siddhanta siromany of Bhaskaracharya II), different types of rays (UV, IR, Heat rays, visible rays - as explained by Bharadvaja) lenses, prisms, magnetic materials like iron and variety of magnets, time, weights and measures, linear parameters. Modern scientific principle**

equivalent ancient observations. Explanations given in yantra sarva sarvawa of Bharadwaja, the vaimanika saastra, dwanthapramapaka yantra/ spectro photometer, etc the scale used in measuring the temperature, the serialization of instrument parts commonly used., graduation method adopted, metallic alloys used in measuring the light waves, etc (all yantra sarvaswa of Maharshi Bhardvaja)

**Ancient Indian Mathematics & Astronomy** (Mathematics and astronomy are the fifth vedanga of vedic literature kown as Jyothisha. There are four vedanga jyothis connected with Rigveda- archa jyothisha- Yajurveda – Yajusha jyothisha, Samaveda samjyothisha and Atharva veda Atharva jyothisha). The later development of th subject matter are directly connected with these jyothisha books): Detailed knowledge are given in the books written by Aryabhatta (I & II), Bhaskara (I & II), Vateswara, Manjula, Lalla, Varahamihira, Parameswara, Sankaranarayana, and many other mathematicians. The four number systems, (Sanskrit number, Aryabhatta number, Bhootha sankya and Katapayaadi number) arithmetic and geometrical progressions and their variety of applications, interest calculations, moving bodies, forward and backward motions, linear and angular measurements, number theories, square/cube roots and power series, determinations, degree/minutes/seconds/ microseconds both for time and angular measurements, various geometrical figures both inscribed one another and independent figures, parameters connected with area, perimeter, volume of squares, triangles, circles, trapeziums, spheres, cones, cyclic quadrilaterals, polygonals, detailed algebra, quadratic equations, monomial and binomial theorems, etc. Hundreds of theorems developed by Aryabhatta, Bhaskara I & II, Sankaranarayana, Sangamagrama Madhavacharya, Puthumana Somayaji, Vateswarana, Aryabhatta II, Sankara Varman, Paramewaracharya..... the application of ka ta pa ya adi number and bhootha sankhya systems made by the above mathematicians.

Determination of Sine, cosine and tangent, Rsine values their squares, square roots, additions and subtractions, determination at degree/



minute/second levels. and their tables, as explained in detailed by Varahmihira/ Vateswara/ Aryabhata II/ Puthumana Somayaji/ Parameswaracharya/ Nilakanta/ Sankaranarayana/ Achuta/ jayadeva/ Manulacharya/ and so on, method of determining these values, angles in degrees and radians, calculations and theorems connected with these values . Relation among radius- arc-chord-circumference - sine - cosine - tangent – angles. Indian theorems known in foreign scientists names such as : Newton's theorems, Gregory's theorem's, Kelvin's theorem, Lhulers theorem, Lebnitzs' series, Taylor series, Tycho Brahe equations, etc.

**Astronomical parameters( As mentioned above; Jyothisaatra is applied ganithasaatra accordind to the fifth vedanga known as jyothisha):** Various astronomical and geographical parameters mentioned in the above books: The spherical shape, size, diameter, circumference, gravity, declination, rotation speed, revolution, celestial/ terrestrial latitude and longitude, parallax in latitude and longitude, earthsine, etc of earth. Many more astronomical parameters described with definition by Vatewaracharya, like co-latitude, prime meridian, and its relation with time, sun rise and sun set, eight type of revolutions of planets, visibility of planets, declination, precision equinox, alpha Aeries point, apogee, perigee, solar and lunar eclipse, calculation of eclipse, diameter of shadow and movement of shadow, instruments used for time calculation and also for the calculation of various astronomical parameters known as yanthras.

Hundreds of parameters described systematically and calculated mathematically on solar and lunar eclipses, changes in the signs, latitude/ longitude, time variations, east –west lines, avanti lines of international importance, the inferior plants and superior planets, occulting of planets and stars, the star constellations, the comets, and their appearance, etc., etc

**Indian Management science ( All Indian management books are directly connected with Itihasa( epics) puranas, subhashitas):** Thousands of modern and relevant management principles explained by Chanakya in (Chanakya) neetisara also known as Chanakya

upadesa, , Bharthru Hari in upadesa sathaka in hundred points, , Vidura in Vidura neetisara as a question answer method of presentation to Dhrutharashtra and Vidura, Bhishma in Bhishmopadesa to the questions asked by Dharma putra,, and also books like Yoga Vaasishta as given by Mahrshi Vasishta, Bhagavath geetha advise given to Arjuna by Lord Krishna, Sukra neeti sara by Sukra muni and many subhashtaas ( advises) mentioned in Pancha thantra, Ramayana, Mahabharata, Thirukkural and so on. They are all applicable even for the management in the 21<sup>st</sup> century.

**Ancient Indian knowledge in Economics (This subject is the upaveda of Rigveda):** The book on artha saastra written by Chanakya known as Koutlileeyam, many cross reference books are also mentioned in arthasastra, books of dharma sastras/ smruthies dealing with this subject. The detailed explanations about money, budget, banking, interest, loans, compound interest, penal interest, surety, witness, documents preparations for loans, pledging of materials, leasing, etc. the detailed method of implementing sales tax, agricultural tax, property tax, gift tax, land tax, house tax, customs duty and penal taxes, etc. ( as described in dharma saastra) can be seen in many books written during BC 500 and before.

**Indian Philosophy (Philosophies either part of Upanishads which are known as vedantas or as part of shaddarsanas:** The philosophical compilations known as darsanas by Vyasa, Jaiminee, Patanjali, Gouthama, Kapila and Kanaada - poorva & utara meemamsa, yoga, nyaaya, vaiseshikaa, are the most important books known as shad darsanas. Many fundamental principles of physics, chemistry, biology, etc are mentioned in the above darsanaas. Sankara's Adwaitha and Madhva's dwaitha. The book of Charvaka known as Charvaka samhita of atheism. Other than the specific philosophical compilations, the philosophy described in upanishad, Bhagavath geetha, Yogavaasishta, etc.

Thus the knowledge of Hindus did not restrict upon mere spirituality and achaaras but also focused on every branch of modern science and technology. That is the reason why many of these knowledge, the

western scientists are patenting now.

**Modern India's Achievements** (The modern Indian achievements in every field is a continuation of the ancient Indian blood and achievements): Since large amount of data are available in this subject, the reader/student can select/collect as much details as possible for continuous learning of the great scientists of modern India and our achievement in space science, harnessing atomic energy, technology of exploding atom bombs, Antarctica expedition, the green revolution, the blue revolution, white revolution, chemistry and achievements in the area of biotechnology, in telecommunication, roads and transportation, education at lower and higher levels, professional education, information technology and computer science and super computer technology, revolutions in print and electronic media. The student can add much more than this, as the specialization has achieved in India, in almost all subject areas.

## QUOTATION FROM INDIAN SCIENTIFIC HERITAGE - MATHEMATICS & ASTRONOMY

### DISCOVERY AND USE OF ZERO:

गायत्रे षड्संख्यामर्धेऽपनीते द्वयङ्के अवशिष्ट स्रयस्तेषु रूपमपनीय द्वयङ्कायः शून्यं स्याप्यम्॥ - In gayatri chandas, one pada has six letters. When this number is made half, it becomes three (i.e the pada can be divided into two). Remove one from three and make it half to get one. Remove one from it, thus gets the zero (Soonya). - PINGALACHARYA IN CHANDA SASTRA 200 B.C.

### CALCULATIONS WITH ZERO :

विकारामायान्ति धनऋणखानि न शून्य संयोग वियोगतस्तु शून्याद्धि शुद्धं स्वमृणं भयं स्व वधादिना खं खहरं विभक्ताः - Nothing happens (to the number) when a positive or negative number is added with 0. When +ve and -ve num-



bers are subtracted from 0, the +ve number becomes negative and -ve number becomes +ve. When multiplied with 0, the values of both +ve and -ve numbers become 0, when divided by 0, it becomes infinity (khahara). - SRIPATI IN SIDDHANTHA SEKHARA 1039 AD.

**DISCOVERY OF PLACE VALUES - I :** यथा एकरेखा शतस्थाने शतं दशस्थाने दशैवं चैकस्थाने यथा च एकत्वेपि स्त्री-माता च उच्यते दुहिता स्वसा च इति - In the unit place the digit has the same value, in 10th place, 10 times the value and in 100th place 100 times the value, is given. - VYASA BHASHAYA TO YOGA SUTRA 650 AD

**DISCOVERY OF PLACE VALUES - II :** यथाचैकापि रेखा स्थानान्यत्वेन निविशमानैक दश शत सहस्रादि शब्द प्रत्यय भेदमनुभवति

One and the same numerical sign when occupying different places is conceived as measuring 1, 10, 100, 1000 etc. - SANKARACHARYA VEDANTA SUTRA BHASHAYA (700 AD)

**KNOWLEDGE ON INFINITY :** अस्मिन् विकारः स्त्रहरे न राशावपि प्रवेष्टेष्वपि निःसृतेषु बहुष्वपि स्याल्लयसृष्टिकाले नन्ते च्युते भूतगणेषु यद्धत् - Nothing happens to the (huge number) infinity, when any number enters (added) or leaves (subtrated) the infinity. During pralaya many things get dissolved in Mahavishnu and after pralaya, during srushti all those things get out of him. This happens without affecting the lord himself. Like that, whatever number is added to infinity or whatever is subtracted from it, the infinity remains unchanged. - BRAHMACUPITHA IN BRAHMASEHUTA SIDDHANTA 600 AD & BHASKARACHARYA II - BEEJAGANITA 1148 AD

**USE OF AVERAGE VALUES :** गणयित्वा विस्तारं बहुषुस्थानेषु तद्युतिर्भाज्य स्थानकमित्या सममित्तिरेवं दैर्घ्यं च वेधे च - (For length, breadth and depth) the measurements should be taken at many places and the sum should be divided by the number of times (places) the measurement is taken. - BHASKARACHARYA II IN LILAVATI 1150 AD

**USE OF FRACTIONS :** द्रम्माद्यत्रिलवद्वयस्य सुमते पादत्रयं यद्भवेत् तत् पञ्चांशक षोडशांशचरणः संप्रार्थितेनार्थिना । दत्तो येन वराटकाः कति कदर्येणार्पितास्तेन मे ब्रूहि त्वं यदि वेत्सि वत्स गणितं जार्तिं प्रभगाभिधाम् ॥ - One man has given to a beggar fraction of 1 dramma (a unit of money). That fraction is one fourth of the one sixth of one fifth of the three fourth of the two third of the half of a dramma. Then tell how much kowdi (a unit fraction of the amount

dramma) was given to the beggar? USE OF RATIO AND PROPORTION :  
 अष्टौ दान्ताश्च यो दम्या इति गावः प्रकीर्तिताः। एकाग्रस्य सहस्रस्य कति दान्ताः कतीतरे॥  
 - (Out of 11 cattle) Eight are tamed and 3 are to be tamed and (how many are) to be tamed) if the number of cows is 1001? -  
 BHASKARACHARYA I - ARYABHATEEYA BHASHAYA 628 AD

PERMUTATIONS AND COMBINATION - I : कटुकतिक्त कषायाम्ललवण मधुरैः सखे  
 रसैः षड्भिः। विदधाति सूपकारो व्यञ्जनमाचक्ष्व कति भेदम्॥ - Friend, a cook  
 prepared varieties of food with 6 savours: pungent, bitter, astringent,  
 acid, saline and sweet. Say what is the possible number of varieties of  
 food that can be made with these savours. - SRIDHARACHARYA IN PATIGANITA  
 220 AD

PERMUTATIONS AND COMBINATION - II : पाशाङ्कुशाहि डमरुक कपाल शूलैः  
 खड्वाङ्गशक्ति शरचापयुतैर्भवन्ति। अन्योन्य हस्त कलितैः कति मूर्तिभेदाः शंभोर्हरेरिव  
 गदारि सरोज शंखचक्रैः॥ - Pasa, ankusa, serpent, damaru, kapala, soola,  
 khatvanga, sakti, chapa, sara with these (ten) items how many permu-  
 tations and combinations are possible for Lord Siva. Similarly with the  
 four items, sanku, chakra, gadha and padma holding in the hands,  
 how many combinations are possible for Lord Vishnu? - BHASKARACHARYA  
 II IN LILAVATI 1114 AD

PARTNERSHIP AND SHARES : समवायकास्तु वणिजः पञ्चैकैकोत्तराधि मूलधनाः।  
 लाभः सहस्रसंख्यो वद कस्मै तत्र किं देयम्॥ - Five partners collaborate in a  
 business. The capital invested by them are (in the ratio) one and the  
 same number increasing successively by one (i.e 1,2,3,4, & 5) re-  
 spectively. Profit that accrued amounts to 1000. Say what should be  
 given to whom. - BHASKARACHARYA I - IN ARYABHATEEYA BHASHYA 628 AD

LOANS AND INTERESTS : कुटुम्बार्थमशक्तेन गृहीतं व्याधितेन वा उपप्लावनिमित्तं च  
 विद्यादापत्कृतं तत्। कन्यावैवाहिकं चैव प्रेतकार्येषु यत्कृतं एतत् सर्वं प्रदातव्यं कुटुम्बेन  
 कृतं प्रभो॥ - Loans are taken for meeting the expenditure connected  
 with economic problems due to family burden, health problems, treat-  
 ment, education, expenditure during accident, marriage of daughter,  
 for performing rituals connected with the demise of the family mem-  
 bers, etc. - VISHNUSMRUTHI 100 AC

INTEREST CALCULATION : मासेन शतस्य फलं पञ्चैको भाव्यकेर्धमय वृत्तो।  
 लेखकपादो वर्षे पञ्चाधिक नवशतीभिश्चम्॥ - The rate of interest being 5% per

month, the commission of surety 1% per month, fee for accountant ½% and charges of the scribe ¼% per month, certain sum amounts to 905 a year. Find the capital, the interest and the shares of the surety?

- SRIDHARACHARYA IN PATIGANITA 990 AD

**RULES OF CHARGING INTEREST :** अथ उत्तमर्णः अधमर्णाद्यथा दत्तमर्थं गृह्णीयात् । द्विकं त्रिकं चतुष्कं पञ्चकं च शतं प्रतिमासं ।। - The loans can be given and taken between borrower and lender. Generally charged interest rates are 2, 3, 4, or 5% per month. सपादपणा धर्म्या मासवृद्धिः । पणशतस्य पञ्चपणा व्यावहारिकी ..... - Reasonable (dharmic) rate of interest is 1.25% per month (i.e 15% per annum) on the transactions with common man for non commercial purposes. But for commercial purposes (for making profit out of it) interest rate can be 5% per month. - VISHNU SMRUTHI 100 B.C

**RULES OF BODIES IN MOTION :** भक्ते विलोमविवरे गतियोगेनानुलोमविवरे द्वौ । गत्यन्तरेण लब्धौ द्वियोगकालावतीतेष्यौ ।।

Whenever two bodies are travelling in the opposite directions, the distance between them is to be divided by the sum of their speeds. If they move in the same direction, the distance is to be divided by the difference of their speeds. This gives the time required for meeting of the bodies or the time elapsed after meeting of the moving bodies. -

ARYABHATA I - ARYABHATEEYA 499 AD

एकौ ना योजनान्यष्टौ यात्यन्यो योजनद्वयम् योजनानं शतं पन्थाः संगमः क्व गमागमे ।।

- One man travels at 8 yojana speed per day. Another travels at 2 yojana per day, starting simultaneously from the same place. After reaching the destination, the first man comes back. If the length of the track is 100 yojana. Say where is the meeting place of the two? (One going forward and the other traveller returning). - SREEDHARACHARYA PATIGANITHA 990 AD

**PROGRESSION OF THE TYPE  $1^2 + 2^2 + 3^2 + 4^2 + \dots$  :** सप्तानां अष्टानां सप्तदशानां चतुर्भुजाश्चितयः । एकविद्यानां वाच्यं पदस्तरास्ता हि वर्गाख्याः ।। - There are (three pyramidal) piles on square bases having 7, 8 and 17 layers which are also squares. Say the number of units there in. -

BHASKARACHARYA I - ARYABHATEEYA BHASHYA 628 AD

**PROGRESSION OF THE TYPE  $1^2 + 2^2 + 3^2 + 4^2 + \dots$  :** चतुरश्रघनश्चितयः पञ्चचतुर्नवस्तरा



विनिर्देश्याः। एकावयवितस्ताः समचतुरश्रेष्टकाः क्रमशः॥ - There are three pyramidal piles having 5, 4 and 9 cuboidal layers. They are cuboidal bricks (of unit dimension) with one brick in the topmost layer. Find the number of bricks used in them. - BHASKARACHARYA I - ARYABHATEYA BHASHYA 628 AD

PROGRESSION OF THE TYPE  $\Sigma n + \Sigma n^2 + \Sigma n^3 + \Sigma n^4$  : द्विगुणतसैकपदं सैकपदं प (द) दलहतं भवति। - The number of terms plus one, as multiplied by twice the number of terms plus one, being (further) multiplied by half the number of terms. संकलितकृतिघनानां संकलितसमासमानां मे कथय। यण्णां सखे पदानां गणयित्वा यदि विजानासि॥ - Friend, if you know, then say after calculation (i) the sum of successive sum of 6 natural numbers (ii) the sum of the squares of the first 6 natural numbers and (iii) the sum of the cubes of first 6 natural numbers. FIRST DEGREE INDETERMINATE EQUATION : मुद्गानां कुडवाः सप्त लभ्यन्ते नवभिः पणेः पणेन कुडव- स्यार्धं तण्डुलानामवाप्यते। ततः पणत्रयं सार्धं गृहीत्वा  $\frac{1}{2}$  शू यणिङ्मम तण्डुलानां प्रयच्छांश मुद्गानां च द्विसङ्गुणम्॥ - 7 kudavas (unit of measurement) of mudga are obtained for 9 panas and  $\frac{1}{2}$  kudava of rice is obtained for one pana. Then O! merchant take  $3\frac{1}{2}$  panas and quickly give me one part of rice and two parts of mudga. - SREEDHARACHARYA - PATIGANITHA 900 AD

FIRST ORDER EQUATION - I : ये निर्मरा दिनदिनार्थं तृतीय वष्टैः संपूरयन्ति हि पृथक् पृथगेव मुक्ताः। वार्षी यदा युगपदेव सखे विमुक्तास्ते केन वासरलवेन तदा वदाशु॥ - By opening 4 inlets separately, one pond gets filled respectively within 1,  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{6}$  days. If all the four inlets are opened together, how much time (in fraction of the day) is required to fill the pond? - BHASKARACHARYA II - IN LILVATI 1114 AD

FIRST ORDER EQUATION - II : नव गुलिका तप्त(च) रूपकसमासस्त्रयाणां (तु) गुलिकानां। त्रयोदशानां च रूपकाणां तदा किं गुलिकामूल्यम्॥ - If 9 gulika and 7 rupaka are equal to 3 gulika and 13 rupaka, what is the price of one gulika? (the answer can be determined through the same method followed above). SREEDHARACHARYA PATIGANITHA 990 AD

EQUATIONS OF HIGHER ORDER - I : बानरकुलत्रिभागः स्वत्र्यंशसमन्वितः सरः प्रययौ। मूलं च पिपासति द्वौ घृततले स्थितौ शेषौ॥ - One third of a troop of monkey with one third of itself has gone to the tank; the square root of the whole troop is afflicted with thirst, and the remaining 2 monkeys

are sitting under the mango tree. What is the total number of monkeys?  $\frac{1}{3}a + \frac{1}{9}\sqrt{a} + a + 2 = a$  - REEDHARACHARYA - PATIGANITHA 990 AD

EQUATIONS OF HIGHER ORDER- II - बाले मरालकुलमूलदलानि सप्त तीरे विलासभरमन्तरगाण्यपश्यम्। कुर्यञ्च केलिकलहं कलहंसयुग्मं शेषं जले यद मरालकुलप्रमाणम्॥ - I saw that one half of 7 times of the square root of the total number of swans were slowly moving away in the river. Remaining 2 are playing in water. What is the number of total swans? (equation:  $\frac{7}{2}\sqrt{a+2}=a$ ) - BHASKARACHARYA - LILAVATI 1114 AD

PYTHAGORUS THEOREM DISCOVERED BY BOUDHAYANA : समचतुरश्रस्यक्षयारज्जुः द्विष्टावर्ति भूमिं करोति। - The diagonal of a square produces double the area of the square. दीर्घचतुरश्रस्यक्षयारज्जुः पार्श्वमानि तिर्यन्मानि च यत्पृथग्भूते कुरुतस्तदुभयं करोति। - Areas produced separately by the length and breadth of rectangle together equal to the area of the (square) produced by the diagonal. - BOUDHAYANA BOUDHAYANA SULBASUTRA 700 BC

ANGULAR DIMENSIONS : अंगगुणवेदहुताशाः कलिका विकलाः समुद्रजलधयः स्वत्पजलछाष्टशशि घृतिशशिनः कलिकाः शराग्नयो विकलाः त्रिज्याकृतिरष्टनवत्रिभुवो विश्वे जिनांशज्या॥ -  $3436\phi 44\phi\phi$  is radius and  $11818047\phi 35\phi\phi$  is square of radius and  $1398\phi 13\phi\phi$  is  $R\sin$  of  $24^\circ$  (both are values in radians). - YATESWARA- YATESWARA SIDDHANTA 880

TRIANGLES : त्रिभुजस्य फलशरीरं समदलकोटि भुजार्धसंवर्गः। - The area of a triangle is the product of the perpendicular and half the base. - ARYABHATTA I ARYABHATEEYA 499 AD कर्णस्त्रयोदश स्यात् पञ्चदशान्यो मही द्विसप्तैव। विषमस्त्रिभुजस्य सखे फलसंख्या का भवेदस्य॥ - What is the area of a scalene triangle in which one lateral side is 13 units, other 15 unit and the base is 14 units. अष्टादशकोच्छ्रयो वंशो यातेन पातितोमूलात्। षट्गत्वासी पतितास्त्रिभुजं कृत्या क्व भग्नः स्यात्॥ - A bamboo of height 18 cubits fell by the wind, it falls at a distance of 6 cubits from the root, thus forming a right triangle, where is the break? - BHASKARA I COMMENTARY TO ARYABHATEEYA 628 AD

CIRCLE - VALUE OF  $\Pi$  : चतुरधिकं शतमष्टगुणं द्वाषष्टिस्तथा सहस्राणां अयुतद्वय विष्कम्भस्यासन्नो वृत्तपरिणाहः॥ - When 100 increased by 4 multiplied by 8 and added to 62,000 gives an approximate value for the circumference of a circle having diameter 20,000 units. - ARYABHATA I ARYABHATEEYA 499 AD अष्टद्वादशषट्काः विष्कम्भस्तत्त्वतो मया दृष्टाः। तेषां समवृत्तानां परिधिफलं मे

पृथक् ब्रूहि ॥ - Diameter of 3 circles are correctly seen by me to be 8, 12 and 6 units respectively. Tell me separately the circumference and areas of the circles. - BHASKARACHARYA I - 628 AD

SOMAYAJI'S THEOREMS : (1) व्यासाद् वनसंगुणितात् पृथगाप्तं त्रयाद्ययुग्विमूलघनेः । त्रिगुणव्यासे स्वमृणं क्रमशः कृत्वापि परिधिरानेयुः ॥ - Multiply the diameter of a circle with 4 and keep it at different places and divide each with the odd numbers beginning from 3, 5, 7,... as their cubes subtracted by the same value. Repeat this and add/subtract alternatively the results to three times the diameter of the circle to get the circumference with the highest degree of accuracy. This theorem can be mathematically represented as follows: Circumference =  $3D + 4D/(3^3 - 3) - 4D/(5^3 - 5) + 4D/(7^3 - 7) - \dots$  (2) वर्गोयुजां वा द्विगुणैर्निरेकैर्वर्गाकृतैर्वर्जित युग्मवर्गैः । व्यासं च षड्घ्नं विभजेत् फलं स्वं व्यासे त्रिनिघ्ने परिधिस्तदास्यात् ॥ - Six times the diameter is divided separately by the square of twice the square of even integers 2, 4, 6.... minus one, diminished by the squares of even integers themselves. The sum of the resulting quotient by thrice the diameter is the circumference. This can be mathematically written as follows: Circumference =  $3D + 6D[(1/2 \times 2^2 - 1)^2 - 2^2] + [(1/2 \times 4^2 - 1)^2 - 4^2] + [(1/2 \times 6^2 - 1)^2 - 6^2] + \dots$  - PUTHUMANA SOMAYAJI - KARANAPADDHATI 1450 A.D

AREA OF CIRCLE AND SPHERE : वृत्तक्षेत्रे परिधिगुणितव्यासपादः फलं तत् क्षुण्णं वेदैरुपरिपरितः कन्दुकस्येव जालं । गोळस्येवं तदपि च फलं पृष्टजं व्यासनिघ्नं षड्भिर्भक्तं भवति नियतं गोळगर्भे घनाख्यम् ॥ - When circumference is multiplied with diameter and that result divided by 4, that will give the area of a circle. This when multiplied with 4 gives the surface area of the globe which is like surface of a ball. This when multiplied with diameter and divided by 6 gives the volume of the sphere of globe. Mathematically it can be written as  $2\tilde{O}r \times 2r/4 = \tilde{O}r^2$  BHASKARACHARYA II - LILAVATI - 1114 A.D

NEWTON GAUSS (1670AD) BACKWARD INTERPOLATION DISCOVERED BY VATESWARACHARYA : यनुषाप्त मुक्त जीवयाते लव्यं सरूपकं दलितम् । लव्यघ्न विवरहतं च संशोध्य नियोज्य विकलज्या ॥ - In modern mathematical form this interpolation formula can be written as  $f(x) = f(x_i) + (x - x_i)1/h Df(x_i - h) + (x - x_i)1/h. (x - x_i + h)1/h. D^2f(x_i - h)^{1/2} - \dots$  - VATESWARA VATESWARA SIDDHANTIA 904 AD



**ARC AND CHORD :** स्वत्पचापच्छधनषष्ठभागतो विस्तार्द्धं कृतिर्भक्तवर्जितम् । शिष्टचापमिहशिञ्जनि भवेत् तद्युतोऽल्पकगुणोऽसकृत्घनः ॥ - The chord of an arc of a circle is obtained from the result of the cube of the length of the arc divided by six times the cube of radius and subtracted from the arc. This can be mathematically presented as follows: Chord  $(R \sin q) = s - (s^3 / 6r^3)$ . Here length of the arc  $s$  is in angular dimensions,  $r$  is the radius and  $q$  is the angle of the arc. - PUTHUMANA SOMAYAJI - KARANA PADDHATHI - 1450 AD परिधेः षष्ठभागज्या विष्कम्भार्धने सा तुल्या । - The chord of one sixth of circumference is equal to the radius of that circle. - ARYABHATTA I - ARYABHATEEYA 499 AD

**LENGTH OF ARC - CHORD :** व्यासाद्यिधातयुतमौर्विकया विभक्तो जीवाद्घ्रिपञ्चगुणितः परिधेस्तुवर्गः । लब्धोनितात् परिधिर्वर्ग चतुर्धभागादाप्ते पदे वृत्तिदलात् पतितेधनुः स्यात् ॥ - One fourth of five times the chord multiplied with square of circumference divided by four times the diameter added with the chord. This value is subtracted from one fourth of the square of circumference. Square root of this is taken and subtracted from half of the circumference to get the arc. **ARC AND ARROW :** ज्याव्यासयोगान्तरधातमूलं व्यासस्तदूनो दलितः शरः स्यात् । व्यासाच्छरोनच्छरसंगुणा च मूलं द्विनिघ्नं भवतीह जीवा । जीवार्धवर्गं शरभक्तयुक्ते व्यासप्रमाणं प्रवदन्ति वृत्ते । - When the sum and differences of diameter and the chord are multiplied, and their square root is taken and if half of that is subtracted from the diameter, the arrow is obtained. The difference of diameter and the arrow multiplied with the arrow, twice the square root of that value gives the chord. The square of half the chord divided by arrow and added with arrow gives the diameter of the circle. - BHASKARA II - LILAVATI 1114 AD

**NEWTON'S INFINITE GP CONVERGENT SERIES DISCOVERED BY NILAKANTA SOMAYAJI :** एवं यस्तुत्यच्छेद परमभाग परमपर्यया अनन्ताया अपि संयोगः तस्य अनन्तानां अपि कल्प्यमानस्य योगस्य आद्यावयविनः परस्परमच्छेदाद् एकोनच्छेदामंश साध्यं सर्वत्रापि समानं एव..... - Thus the sum of an infinite series, whose later terms (after the first) are got by diminishing the preceding or by the same divisor, is always equal to the first term divided by one less than the common mutual divisor. - NILKANTA ARYABHATEEYA BHASHAYA 1444

**SINE, COSINE, RADIUS AND ARC :** अन्योन्यकोटिहतयोरभिमत गुणयोस्त्रिजीवया हतयोः । योगवियोगौ स्यातामभिमतगुणापयोगविवरगुणौ ॥ - The sum of the products

of Sin A and Cos B and when angles are exchanged, Sin B and Cos A, gives the Sin of the sum of the angles. Similarly the difference of the above gives the value of the sin of angular difference.  $\sin(A+B) = \sin A \cos B + \cos A \sin B$  And  $\sin(A-B) = \sin A \cos B - \cos A \sin B$ .

यद्वेष्टचापगुणत चरवर्गयोगमूलार्धमिष्टधनुरर्धगुणः प्रदिष्टः । ज्यानां निजत्रिगुणवर्गविशेषमूलं कोटिस्तदूनसहितीत्रिगुणोस्वभाणी ॥ - Square root, of the square of a chord (R sin q) diminished from squares of radius gives the koti (R cos q). This subtracted from radius gives the (small) arrow of arc. This added to radius is big arrow of the arc..... - PUTHUMANA SOMAYAJI - KARANA PADDHATI 1450

TAYLOR (1685 AD) SERIES OF SINE AND COSINE DISCOVERED BY NILAKANTA : इष्टदोः कोटि धनुषोः स्वसमीपसमीरते ज्ये द्वे सावयवे न्यस्य कुर्याद् ऊनाधिकं धनुः द्विज्ज तल्लिप्तिकाप्तैक शरशैल शिखीनन्दवः न्यस्याच्छेदाय चमिषास्तत्संस्कार विधित्सया चितवैकां प्रक्षिपेज्जह्यात् तद्धनुष्यधिकोणके अन्यस्यां अथ तां द्विज्जां तपार्थस्यां इति सस्कृतिः संत ते कृत संस्कारे स्वगुणौ धनुषास्तयोः - Placing the sine and cosine chords nearest to the arc, whose sine and cosine chords are required, get the arc difference to be subtracted or added. For making the correction, 13,751 should be divided by twice the arc difference in minutes and the quotient is to be placed as the divisor, divide the one (sine or cosine) by this divisor and add to or subtract from the other (cosine or sine) according as the arc difference is to be added or subtracted. Double this result and do as before. Add or subtract the result to or from the first sine or cosine to get the desired sine or cosine chords. - NILAKANTA - TANTRA SANGRAHA 1444 AD

NEWTON GAUSS (1670) INTERPOLATION FORMULA DISCOVERED BY GOVINDASWAMI : गच्छाद्यात गुणान्तरवपुर्गार्तैष्य दिधासनाच्छेदाभ्यास समूहकार्मुककृतिप्राप्तात् त्रिभिस्ताडितात् वेदैर्हिषह्मिर् अवाप्तम् अन्त्यगुणजे राश्योः क्रमात् अन्त्यभेः गन्तव्याहक वर्तमानगुणजाच्छापाप्तं एकादिभिः । अन्त्याद् उत्क्रमतः क्रमेण विषमैः सङ्ख्याविशेषैः क्षिपेद्भङ्गत्वाप्तं, यदि मौर्विकाविधिर् अयं माख्यः क्रमात् वर्तते शोध्यं व्युत्क्रमतास्तथाकृतफलं..... - Mathematically this formula is summarised as follows:  $F(x+nh) = Df(x) + nf(x) + \frac{1}{2}n(n-1)(Df(x) - Df(x-h))$  Multiply the difference of the last and the current sine differences by the square of the elemental arc and further multiply by three. Now divide the result so obtained by four in the first rasi, or by six in the second rasi. The final

result thus obtained should be added to the portion of the current sine difference (got by linear proportion). In the last rasi, multiply the linearly promotional part of the current sine differences by the remaining part of the elemental arc and divide by the elemental arc. Now, divide the result by the odd numbers according to the current sine difference, when counted from the end in the reverse order. Add the final result thus obtained to the portion of the current sine difference. These are the rules for computing true sine differences for sines. In the case of versed sines, apply the rules in the reverse order and the above corrections are to be subtracted from the respective differences. - GOVINDASWAMI - COMMENTARY FOR MAHABHASKAREEYA 800 AD

NEWTON'S (1660 AD) POWER SERIES DISCOVERED BY SOMAYAJI : निहत्य चापवर्गेण चापं तत्तत् फलानि च हरेत् समूलयुग्मवर्गस्त्रिज्यावर्गहतैः क्रमात् चापं फलानि चाधोघोन्यस्योपर्युपरि त्यजेत् जीवाप्त्यै, संग्रहोऽस्यैव विद्वान् इत्यादिनाकृतः निहत्य चापवर्गेण रूपं तत्तत् फलानि च हरेद् विमूलायुग्मवर्गस्त्रिज्यावर्ग हतैः क्रमात् किन्तु उद्यासाद लोनीया द्विघ्नोनाष्ट विभाज्यतां फलान्याद्याः क्रमशोन्यस्योपर्युपरि त्यजेत् शराप्त्यै, संग्रहोऽस्यैव स्तेनस्त्रीत्या दिनाकृतः

Multiply repeatedly the arc by its square and divide by the square of even numbers increased by that number and then multiplied by the square of radius. Place the arc and result one below the other and subtract each from what is above it. To derive the arc, which are collected, beginning with the expression *Vidvan* (katapayadi number). Multiply repeatedly, the unit measurement which is the radius, by the square of the arc and divide by the square of even numbers decreased by that number and then multiplied by the square of radius; the first is, however, to be divided by twice the radius. Place the results one below the other and subtract each from the one above it. That is the method to derive the *saras*, which are collected in the beginning with *stena*. (This equation is now known as Newton power series.) - PUTHUMANA SOMAYAJI - KARANAPADDHATI (1450 AD)

VOLUMES OF CONES : समखातफलत्रयंशोः सूचीखाते फलं भवति । - The one third of the volume of the uniform cylinder is the volume of the cone. परिधिर्मितिलग्रस्य राशोस्त्रिंशत्करः किल अन्तर्कोणस्थितस्यापि तिथितुल्यकरः सखे । बहिष्कोण स्थितस्यापि पञ्चघ्ननव सम्मितः तेषामाद्यक्ष्व मे क्षिप्रं घनहस्तात् पृथक् पृथक् ।। -



Friend, the food grains are kept at a circumference of 30 cubit in the floor, outside corner of the room, inside corner and side of the wall. Find out the volume of the grain if the height is 45 cubit. - BHASKARA II LILAVATI 1114 AD

LHUIER'S (1782 AD) FORMULA DISCOVERED BY SOMAYAJI - दोष्णाम्द्वयोर्द्वयोर्धातयुतानां तिस्राणां वधात् एकैकोनेतरात्रैक्यं चतुष्कवधाभाजितं लब्धमूलेन यदवृत्तं विष्कम्भार्धं निर्मितं सर्वं चतुर्भुजक्षेत्रं तस्मिन्नेव तिष्ठहते - The three sums of the product of sides, taken two at a time are to be multiplied together and divided by the product of the sums of the sides taken three at a time and diminished by the fourth. If a circle is drawn with the square root of this quantity as radius, the whole quadrilateral will be situated inside it. - PARAMESWARA COMMENTARY FOR LILAVATI (1360 AD)

GREGORY'S (1632 AD) SERIES FOR INVERSE TANGENT DISCOVERED BY MADHAVA CHARYA

इष्टज्यात्रिज्ययोर्धातात् कोट्याप्तं प्रथमं फलं ज्यावर्गं गुणकं कृत्वा कोटिवर्गं च हारकं प्रथमादिफलेभ्योऽथ नेया फलं कृतिर्मुहुः एक त्रयाद्योज संख्याभिरभक्तेष्वेतेष्वनुक्रमात् ओजानां संयुतेस्त्यक्त्वा युग्मयोगं धनुर्भवेत् दोः कोट्योरलपमेवेह कल्पनीयं इहस्मृतं लब्धीनां अवसानं स्यान्न तथापि मुहुः कृते - Obtain the first result of multiplying the ज्या (R sine q) by the trijya (radius) and dividing the product by koti (R cos q). Multiply this result by the square of the ज्या and divide the square by the koti. Thus we obtain a second result a sequence of the further results by repeatedly multiply by the square of the ज्या and dividing by the square of the koti. Divide the terms of the sequence in order by the odd numbers 1,3,5,...; after this, add all the odd terms and subtract from them all the even terms (without disturbing the order of the terms). Thus is obtained the dhanus whose two elements are the given ज्या and koti. (Here the smaller of the two elements should be taken as the ज्या, since other wise the series obtained will be non finite) (use of Tangent) - MADHAVA YUKTI BHASHA? (1350 AD)

LEBNITZ (1673 AD) POWER SERIES DISCOVERED BY SOMAYAJI : व्यासे वारिधि निहतं रूपहते व्यास सागराभिहते शिशरादि विषमसंख्याभक्तमृणं त्वं पृथक् क्रमात्कुर्यात् ।। - Multiply the diameter by 4. Subtract from it and add to it alternately the quotients obtained by dividing

four times the diameters by the odd integers 3, 5, 7,.... This will give the fine value of the circumference i.e  $\tilde{O}/4 = 1 - 1/3 + 1/5 - \dots$  - **PUTHUMANA SOMAYAJI - KARANAPADDHATI (1440 AD)**

**DE MOIVRE'S (1650 AD) APPROXIMATION** DISCOVERED BY **MADHAVA CHARYA** : अस्मात् सूक्ष्मतरं ऽन्यो विलिख्यते कश्चनापि संस्कारः अन्ते सम संख्यादलवर्गसैको गुणः स एव पुनः। युगगुणितो रूपयुतः समसंख्यादलहतो भवेद् हारः त्रिशरादि विषमसंख्या हरणात् परं एतत् एव वा कार्यम्।। - A correction for circumference still more precise is being stated here. The multiplier is the square of half the even integer increased by unity. This multiplier multiplied by 4, then increased by unity and then multiplied by half the even integer is the divisor. This correction may be applied after the division by odd integers, 3, 5, etc. i.e Circumference =  $4D (1 - 1/3 + 1/5 - 1/7 + \dots + \dots - 1/n(\frac{1}{2}(n+1)^2 + 1, ((\frac{1}{2}(n+1)^2 \times 4 + 1) (\frac{1}{2}(n+1)))$  - **MADHAVA KRIPA KRAMAKARI (1350 AD)**

**DE MOIVRE'S (1650 AD) APPROXIMATION** : यत्संख्याया ऽत्र हरणे कृते निवृत्ताहतिस्तु जाभितया तस्या

ऊर्ध्वगतास्यास्समसंख्या तदलं गुणे ऽन्ते स्यात् तद्वर्गरूपहतो हारो व्यासान्विताततः प्रयत् तस्यां आप्तं स्वमृणे कृते धने शोधनान्च करणीयं सूक्ष्मः परिधिः सा स्यात् बहुकृत्वो हरणतो ऽतिसूक्ष्माश्च - ..... Let the process stop at a certain stage, giving rise to a finite sum, multiply four times the diameter by half the even integer subsequent to the last odd integer used as divisor and then divide by the square of the integer increased by unity. The result is the correction to be added to or subtracted from finite sum. The choice of addition or subtraction is depending on sign of the last term in the sum. The final result is the circumference determined more accurately than by taking a large number of terms: - **MADHAVA YUKTIBHASHA2 (1350 AD)**

**HORIZON** : आवेष्टमानमथ तानि दलप्रयुत्या यद्वृत्तमत्र हरिजं क्षितिजं तदाहुः यस्मिन् भवेत् समुदयोऽस्तमयोऽखिलानां प्राच्यां क्रमादपरदिश्युद्धेचराणां - The great circle which goes round them, dividing each of them into two equal parts, is called harija or kshitiija. This in modern astronomy is horizon. This is the circle on which rising and setting of stars and planets take place towards east and west respectively. - **YATESWARA SIDDHANTA 880 AD**

**ASTRONOMICAL DEFINITIONS** : ऊर्ध्वमथोऽपरपूर्वमिहाद्यं प्रादुरिदं सममण्डलमन्यत्।

तद्वदिहोत्त रदक्षिणदिक्स्थं वृत्तयुगं विदिशोरपि तद्वत्॥ - Vertical circle passing through the west and east cardinal points is the first circle: this is called the samamandala. (This circle is the prime vertical. Another similar vertical circle (called the yaamyottara-vrutta) which passes through the north and south cardinal points is called the meridian. - VATESWARA - VATESWARA SIDDHANTA. 880 AD

TYCHO BRAHE REDUCTION OF ECLIPTIC DISCOVERED BY ACHYUTA PISHAROTI : पातो नस्य विद्योस्तु कोटिभुजयोर्जीवे मितस्ताडयेत् अन्त्यक्षेप शराहतं वधममुं विक्षेपकोट्याहरेत् । लब्धं व्यासदलोद्धृतं हिमकरे स्वर्गे विपाते विधी युग्मायुग्मपदोपगे विधुरयमस्पष्टो भगोले भवेत् ॥ - Multiply the tabular cosine and sine of the moon minus node and the product by the tabular versine of the maximum latitude of the moon. Divide this by the tabular cosine of the latitude at the particular moment and the quotient is to be divided again by the tabular radius. The result is to be added to or subtracted from the moon's longitude, as the moon minus node is in an even or an odd quadrant, respectively. The true moon measured on the ecliptic is thus obtained. - ACHYUTA PISHAROTI SPHUTANIRNAYA

EQUATOR : स्रस्वस्तिकाद् दक्षिणतोऽक्षभागी पाता(ल) संज्ञाच्च तथोत्तरेण । नाड्यङ्कितं वैषुवतं तदुक्तं वृत्तं भगोलस्य स्रगोलमध्ये ॥ - The sphere of the asterisms lie within the sphere of the sky. Great circle of the sphere of asterisms which lies towards the south of the zenith by an amount equal to the degrees of local latitude and towards the north of nadir by the same amount and which is graduated with the division of nadis is the vishuvathvrutta. This circle is called the equator. 6 O'CLOCK

CIRCLE - पुर्वापरक्षितिजसङ्गमयोगतज्ज्य याम्यादधः पललवैः क्षितिजा द्विलग्नं सौम्यादधोपरि समग्रुवमार्गं संस्यमुन्मण्डलं दिननिशोः भयवृत्तिकृतात् - Passing through the two points of intersection of prime vertical and horizon, lying below the south cardinal point by the degrees of local latitude, fastened to the horizon, and lying above the north cardinal point, passing through the north celestial pole, is the Unmandala, the cause of decrease and increase of the day and night. (This in modern astronomy is known as the 6'o clock circle.) CIRCLE OF DIURNAL MOTION : हरिजे परपूर्वमण्डलघुज्यावृत्तविशेषशिञ्जिनी । उदयाग्रगुणो घुमण्डले भूज्योदवृत्तकुजान्तरांशजीवाः ॥

- R sine of the arc of the horizon lying between the prime vertical and the diurnal circle of the planet is the R sine of agra (now known as the rising point of the planet) and the R sine of the degrees of diurnal circle lying between six o' clock circle and the horizon is bhoojya (bhuijya) which is termed as Earthsine. DAY RADIUS : कान्तिज्यावर्गानात् त्रिज्यावर्गात्पदे घुजीवा स्यात् । त्रिज्याका



न्तिज्यान्तरसमासघातस्य मूलं वा ॥ - Day radius is equal to the square root of the difference obtained by subtracting the squares of R sine of the declination from the square of the radius or the square root of the product of the difference and the sum of the radius and the R sine of the declination. ECLIPTIC : नाह्याह्ववृत्ते ऽजितुलादिलग्नं जिनांशकैर्दक्षिणतो मृगादौ । सौम्ये शीतमन्दिरादावपक्रमाख्यं तदुशन्ति वृत्तम् ॥ - Fastened to the so called nadivrutta or the equator at the points of Aries and Libra and lying 24 degrees of the south (of equator) at the first point of Capricorn and 24 degrees to the north (of equator) at the first point of Cancer, there is a great circle called the apakrama vrutta (now known as the ecliptic) - VATESWARA SIDDHANTA 880 AD

DAY DIAMETER : विषुवज्ज्या ऽ ऽयामर्धवर्गविश्लेषमूलमवलम्बकः । क्रान्तित्रिज्या कृत्पोरन्तरपदं द्विगुणं दिनव्यासः ॥ - Square the sine of latitude and deduct from the square of the radius. Its square root is the sine of the co-latitude (its arc being the co-latitude). Square the sine of the declination deduct from the square of the radius and find its root. Twice the result is the day diameter. - PANCHASIDDHANTIKA 4-23 - VARAHA MIHIRA 505 AD

SETTING POINT OF ECLIPTIC : प्राच्यांकुजापक्रमवृत्तसङ्ग प्राग्लग्नमाहुः (परितो ऽस्त लग्नं) । (लग्नादमवेत्) स (प्त) म (रा) शि (र) स्त तस्या (स्त) कालो ऽभ्युदयो ऽस्य भूयात् ॥ - Point of intersection of horoizon and the ecliptic in the eastern half of the celestial sphere is called praglagna. I.e. the rising point of ecliptic; the same in the western half is called astalagna, known as setting point of ecliptic. RISING - SETTING LINE : व्यासार्यवृत्ते ऽन्तरमेतयोः स्याच्चरार्धजीवा परपूर्वयोस्तत् । अग्राग्रयोर्द्व हरिजे निबद्धं सूत्रं ग्रहाणामुदयास्त संज्ञम् ॥ - The arcual distance between the six o'clock circle and the horizon measure, along the R circle trijyavrutta known as great circle of the celestial sphere, supposed to be of radius 3438' (minute of angle) is the charardhajya. It is called the R sine of the Ascensional difference. A thread tied to the extremities of the agra on the eastern and western halves of the horizon is called the udayaastasutra. (In modern astronomy it is known as the rising - setting line of planets). - VATESWARA SIDDHANTA 880 AD

DAY RADIUS AND EARTHSINE : क्रान्तित्रिमान्तरज्या ध्रुज्या वा चरदल जीवया ह्ता त्रिज्याभिति जीवघ्ना स्वाहोरात्रार्धजीवा वा ॥ - Rsine of the difference between the three signs and the declination is also equal to the day radius. Day radius multiplied by earthsine and divided by the R sine of the Ascensional difference gives the day radius. SUN'S PRIME VERTICAL : ऊर्ध्वमधो ऽपरपूर्वमिहाद्यं प्राहुरिदं सममण्डलमन्यत् । तद्वदिहोत्तरदक्षिणदिक्स्थं वृत्तपुणं विदिशोरपि तद्वत् ॥ - Vertical circle passing through the west and east cardinal points is the first circle called

samamandala or the prime vertical. - VATESWARA SIDDHANTA- GOLA. 3-1, 2 - 880 AD

**PARALLAX-I :** तिथेर्नतस्य क्रमशिञ्जिनी हता क्षमध्यलग्नप्रमयेन शङ्कुना ।

क्षमाषट्काब्धिशराङ्कनेत्रहृद् बिलम्बने स्याद् घटिकादि वा फलम् ॥ - R sine of the hour angle at the amavasya multiplied by R sine of the altitude of the meridian ecliptic point and divided by 2954961 gives the parallax in ghatikas at mid eclipse. **PARAL-**

**LAX-II :** त्रिराशिजीवा बलनज्यका हता शिलीमुखैरङ्गुलतां व्रजन्ति ताः द्विसङ्गुण दृष्टिगतिः

शराचलैर्विभाजिता लम्बननाटिका फलम् - Radius and the valanajya when divided by 5, are converted into angulas. The R sine of driggati multiplied by 2 and divided by 75 gives ghatika of the parallax in longitude. **PARALLAX-III :**

नतक्रमज्याम्बरशङ्कुनिघ्ना स्याल्लम्बनं तत्परसेषु हृत्वा दृक्षेप भुक्त्यन्तरयोश्च घातः

स्त्रबाणयुग्मक्षिप्तो नतिः स्यात् - R sine of the hour angle multiplied by Rsine of

altitude of the meridian ecliptic point and divided by 5625 gives parallax in longi-

tude. The Difference of true motions of the Sun and the moon multiplied by the

Rsine of drikshepa and divided by 2250 gives the parallax in latitude. (Sishyadhi

vruddhi Tantra 13-12) **APOGEE, PERIGEE AND ORBIT OF EARTH :**

स्वोच्चात् षड्भागाध्यधिको यदा तदा भवति स्वनीचस्थः । दूरेणोच्चग उर्व्याः कर्णवशान्नोच्चगो

निकटे ॥ - When a planet is at a distance of 6 signs from its apogee, it is said to be

at the perigee or neecha. When a planet is at the apogee, it is farthest from the earth

when at the perigee, it is nearest to the earth. This is so because of the length of the

hypotenuse in each case (Sishyadhi vruddhi Tantra 14-10) **SHAPE OF EARTH :**

गगनमरुदाग्निजलमृण्मयो महाभूतगुणयुतः स्थः । कक्षाभिरावृतोऽयं भपञ्जरान्तश्च

भूगोलः ॥ - Spherical earth, made of ether, fire, air, water and clay (Panchabhoothas)

and thus have all the properties of the five elements, surrounded by the orbits and

extending upto the sphere of stars, remain in the space **प्रगुणःपरिधेः शतांशको**

**गणितज्ञाः कथयन्ति दृश्यते । प्रतिभाति तदा समा मही विषये यत्र तथैव गम्यते ॥ -**

Mathematicians say that one hundredth of the circumference of the earth appears

to be plane. So, that portion of the earth appears to be plane to an observer

(Sishyadhi vruddhi Tantra 20-35) - LALLACHARYA SISHYADHI VRUDDHI TANTRA

700 AD

**ROTATION OF EARTH - I - प्राणेनेति कलां भूयदि तर्हि कुतो व्रजेत् कमध्यानम् आवर्तन**

**मुर्व्यश्चेन्न पतन्ति समुच्छ्रयाः कस्मात् ॥** If earth rotates at a speed of 1' of an angle

in 4 seconds, will not the things on the loft fall? Where does the earth go in this

speed? (Brahmasphuta siddhanta 11-17). - BRAHMAGUPTA BRAHMASPHUTA

SIDDHANTA 629 AD

**FOUR QUADRANTS OF EARTH :** उदयो यो लङ्कायां सोऽस्तिमयः सवितुरेव सिद्धपुरे ।

मध्याह्नो यवकोट्यां रोमकविषयेऽर्धरात्रं स्यात् ॥ - When it is Sunrise in Lanka,



the same Sun sets in Siddhapura. (Gautimaala). It is noon in Yavakoti (Korea) and midnight in Romaka (Rome) (Aryabhateeyam 4-13) - ARYABHATA-I (499 AD)

**GLOBE :** समवृत्तपृष्ठमानं सूक्ष्मं गोलं प्रसाध्य दारुमयं स्थगितार्कं समादिकृतकाल भोगरेखाद्वये परिधौ ।। - Perfectly circular throughout and spherical, made of wood, marked with degrees and minutes, incorporated with lines both longitude and latitude at ends, is the golayantra. (Panchasiddhantika 14-23) - VARAHAMIHIRA PANCHASIDDHANTIKA (505 AD) काष्ठमयं समवृत्तं समन्ततः समगुरुं लघुं गोलं पारदतैलजलैस्तं भ्रमयेत् स्वधिया च कालसमं ।। - Made of wood, fully circular, uniform, equally dense throughout and spherical shaped golayantra, which rotates at a fixed rate of time as the earth does by the help of mercury, oil and water, by the application of our intelligent calculation, is the golayantra-Globe. - नृषियोजनं, जिला भूव्यासो ..... - 8000 Nr units is equal to one yojana. The diameter of

earth is 1050 yojana. **ROTATION OF EARTH - II :** कु णि शि बु ण्णु षु ख्वा प्राक् ..... - Eastward rotations of the earth in one Yuga is 1582237500 अनुलोम गतिर्नास्थः पश्यत्यचलं विलोमगं यद्वत् । अचलानि भानि तद्वत् समपश्चिमगानि लङ्कायाम् ।। - Just as a man in a boat moving forward sees the stationary objects as moving backward, so are the stationary stars and celestial bodies seen by the people at equator (Lanka) as moving exactly towards west. ....कु आवर्ताश्चापि नास्त्राः ।। - The rotation of the earth is the cause of days (Aryabhateeyam 3-5). - ARYABHATA-I ARYABHATEEYA (499 AD)

**MERIDIAN :** लङ्कायामेकं शङ्कुकीलं प्रतिष्ठाप्य तेनैकं सूत्राग्रं बद्ध्वा पुनर्मरुतपरि तदग्रमन्यत् बद्ध्वा यथा यथा वृश्यते.... तद्वत् भूमावपि काचिद्रेख । लङ्कातः खरपुरतः मेरुमस्तकान् वगाह्य स्थिता सा पुनरत्रा-देशान्तरविधायिनी स्यात् ।। - Fix a pole in Lanka, tie thread on that, take the other end to the North pole, tie it there also, then one can see the line of the thread passing through Lanka, Kharapuri, Arctic point and so many other countries upto the top of Meru. This is international meridian line (Sankaranarayana on Laghubhaskareeya I-23) - SANKARANARAYANA I LAGHUBHASKAREEYA (950 AD)

**GRAVITY :** आकृष्टिशक्तिश्च मही तथा यत् खस्यं गुरु स्वाभिमुखं स्वशक्त्या । आकृष्यते तत्पततीव भाति समे समन्तात् ख पतत्ययं खे ।। - This earth attracts whatever solid materials are in the space, by her own force of attraction towards her (earth). All those subjected to this attractional force fall, to the earth. Due to equal force of attraction among the celestial bodies, where can each among them fall? (Siddhanta siromani Bhuvanakosham 6) - BHASKARA II SIDDHANTA SIROMANY (1114 AD)

**MERIDIAN AND TIME :** देशान्तरघटीभुज्जा मध्या भुक्तिर्धुचारिणां षष्ट्या भक्तमृणं



प्राच्यां रेखायाः पश्चिमे घनम्॥ - The time is calculated based on the meridian. Divide the time by 60... and the longitude is calculated. Towards the east subtract and towards the west add the number (Laghubhaskareeyam 1-31) - BHASKARA I LAGHUBHASKAREEYA (628 AD)

MERIDIAN AND TIME : पञ्चाशता त्रिभिस्त्रयंशसंयुतेर्योजनेश्च नाह्येका। समपूर्वं पश्चिमस्थैर्नित्यं शोष्या च देया च॥ - One nadi for every 53 1/3 yojanas has to be deducted or added (to Ujjaini) by the people in places east and west, respectively of the Ujjaini meridian. (Panchasiddhantika 9-10) - VARAHAMIHIRA - PANCHASIDDHANTIKA (605 AD)

ECLIPSE-I : किमर्थंजसुरः कश्चिद्राहुर्नाम संहिकेयोऽर्कं चन्द्रं च ग्रसत इतिश्रूयते। सपि पीराणिक श्रुतिरेव ! कः पुनरिह राहुरित्युच्यते॥

What does it mean that Asura is responsible for the eclipse? Others say that a snake Rahu swallows the Sun and the Moon! Those are puranic stories! Then what is called the Rahu? - SANKARANARAYANA COMMENTRAY TO LAGHUBHASKAREEYA 250 AD छादयति शशी सूर्यं, शशिनं महती च भूच्छाया। - Moon covers (shadows) the Sun and the great shadow of the earth covers the moon (which causes the eclipse) - ARYABHATA I ARYABHATEEYA (499 AD)

ECLIPSE-II : अत एव भूच्छाया चन्द्रग्रहणस्य कारणं - That is why it is said that the shadow of the earth is the cause for the lunar eclipse. - SANKARANARAYANA COMMENTRAY TO LAGHUBHASKAREEYA

जसुरो यदि मायया युतो नियतोऽतिग्रसतीति ते मतम्। गणितेन कथं स लभ्यते ग्रहकृत्पर्व विना कथञ्चन॥ - If you are of the opinion that an artificial demon is always the cause of an eclipse by swallowing, then how is it that an eclipse can be determined by means of calculations. Moreover why is then not an eclipse occur on a day other than the day of new or full moon - LALLACHARYA SISHYADHI VRUDDHI TANTRA 700 AD

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